NOVEMBER 8, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Continuous Casting

Fewer Steps to Finished Steel

Skeptics are fewer as commercial units show early successes. Potential users are waiting for the first cost figures, p. 88

✔ **CIO-AFL Merger? What It Means, If It Comes, p. 45**

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A "STOCK" REPORT

that's always profitable

Once more, Lamson offers a service to help you in purchasing bolts & nuts.

This Stock List is a monthly compilation of availabilities of the different types and styles of Phillips and slotted machine and tapping screws.

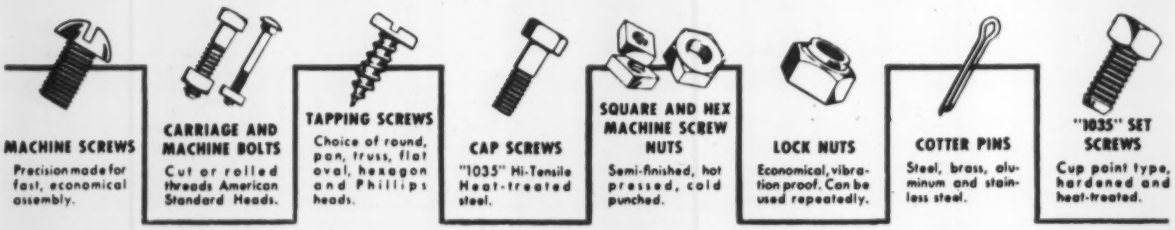
If your requirements fall within this group, you will find it profitable in terms of certain shipment, fast delivery, advantageous shipping costs and convenience, to request this "Stock Report" from Lamson & Sessions. With this method of complete stock listing we are, in fact, your warehouse inventory of fasteners at no cost to you.

***Regular Inventory— Not Surplus!**

This stock list, printed in an easy-to-file size, is yours AT NO COST. It will be sent each month simply by requesting it. Write today for your monthly "Stock Report".

Lamson & Sessions

The LAMSON & SESSIONS Co.
1971 West 85th St. • Cleveland 2, Ohio
Plants at Cleveland and Kent, Ohio • Birmingham • Chicago



MACHINE SCREWS — Precision made for fast, economical assembly.

CARRIAGE AND MACHINE BOLTS — Cut or rolled threads American Standard Heads.

TAPPING SCREWS — Choice of round, pan, truss, flat oval, hexagon and Phillips heads.

CAP SCREWS — "1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX MACHINE SCREW NUTS — Semi-finished, hot pressed, cold punched.

LOCK NUTS — Economical, vibration proof. Can be used repeatedly.

COTTER PINS — Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS — Cup point type, hardened and heat-treated.

Quenching Media for Alloy Steels

This is the seventh of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

In the quenching of alloy steels, several points require consideration, among them being the size and shape of the piece, the type of steel involved, the quenching medium, and proper agitation of the quenching bath.

The composition of the steel has an important bearing on the selection of a quenching medium. As an example: shallow-hardening steels require a fast cooling rate, whereas deeper-hardening steels require progressively slower rates as the alloy content increases.

Three commonly used types of quenching media for alloy steels are water, oil, and air. These are discussed below in the order of quenching severity:

(1) WATER. Fresh water is entirely satisfactory only when used as a flush. Salt-water solutions are generally used in still baths to avoid the bad effect of bubbles resulting from dissolved atmospheric gas. It should be noted that the quenching rate drops as water temperature is increased. The range of 70 deg to 100 deg F is recommended.

(2) OIL. An oil quench cools more slowly than water, and faster than air. Oil-hardening steels can be hardened with less distortion and greater safety than water-hardening steels. Mineral oils are generally used because of their low cost and relatively stable nature.

(3) AIR. If sufficient alloying elements are present, critical cooling rates are decreased to the extent that certain steels can be quenched in either still or forced air.

While the choice of quenching medium is of prime importance, there is another factor that should not be overlooked. This is the agitation of the quenching bath. The more rapidly the bath is agitated, the more rapidly heat is removed from the steel, and the more effective the quench.

Bethlehem metallurgists will gladly help you with any problem related to quenching or other phases of heat-treatment. They are men of long practical experience in this field, and they understand fully the advantages and limitations of each method. Always feel free to call for their services; their time is yours, without obligation.

Remember Bethlehem, too, when you are next in the market for AISI standard alloy steels, special-analysis steels, or carbon grades. We are always in a position to meet your needs promptly.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

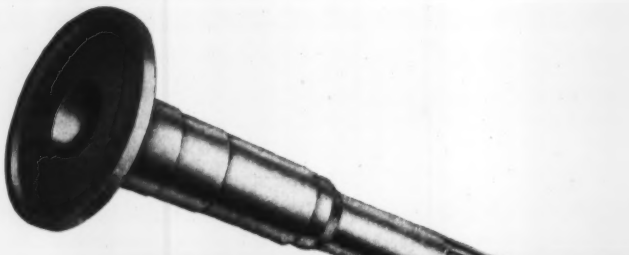
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM ALLOY STEELS

BETHLEHEM STEEL

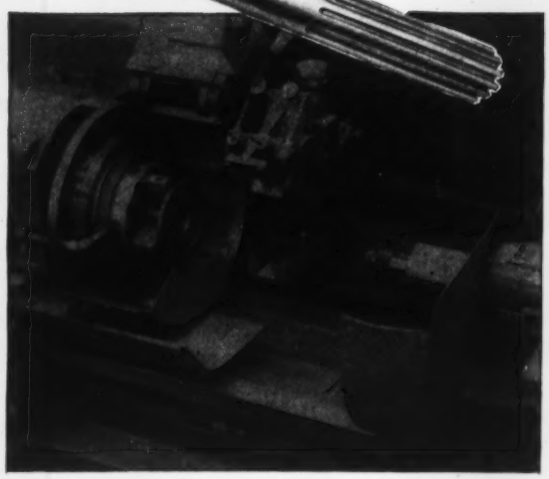
5½ BILLION HORSEPOWER ON THE GO!

. . . your share is a little more dependable, more responsive, because of Heald precision-finished parts like this



Yours is among the more than 45 million passenger cars representing some 5½ billion horsepower in use today—a real tribute to the automotive industry and the precision mass production that has made it possible. There are many Heald machines in this production picture, precision finishing hundreds of different parts. The one shown here is a typical example.

Applied to any job, Heald precision means time and money saved—a finer, longer-lasting product that can stay ahead in the competitive race. That's why IT PAYS TO COME TO HEALD.



The model 271 Size-Matic Internal above precision grinds two different I.D.'s simultaneously in automatic transmission output shafts. Wheelhead spindle carries two wheels of different diameters. Air-operated diaphragm chuck simplifies loading. Entire operating cycle—rough grind, dress, finish grind, size and retract—is fully automatic. Constant feed throttling maintains consistent feed rates regardless of internal or external temperature changes.

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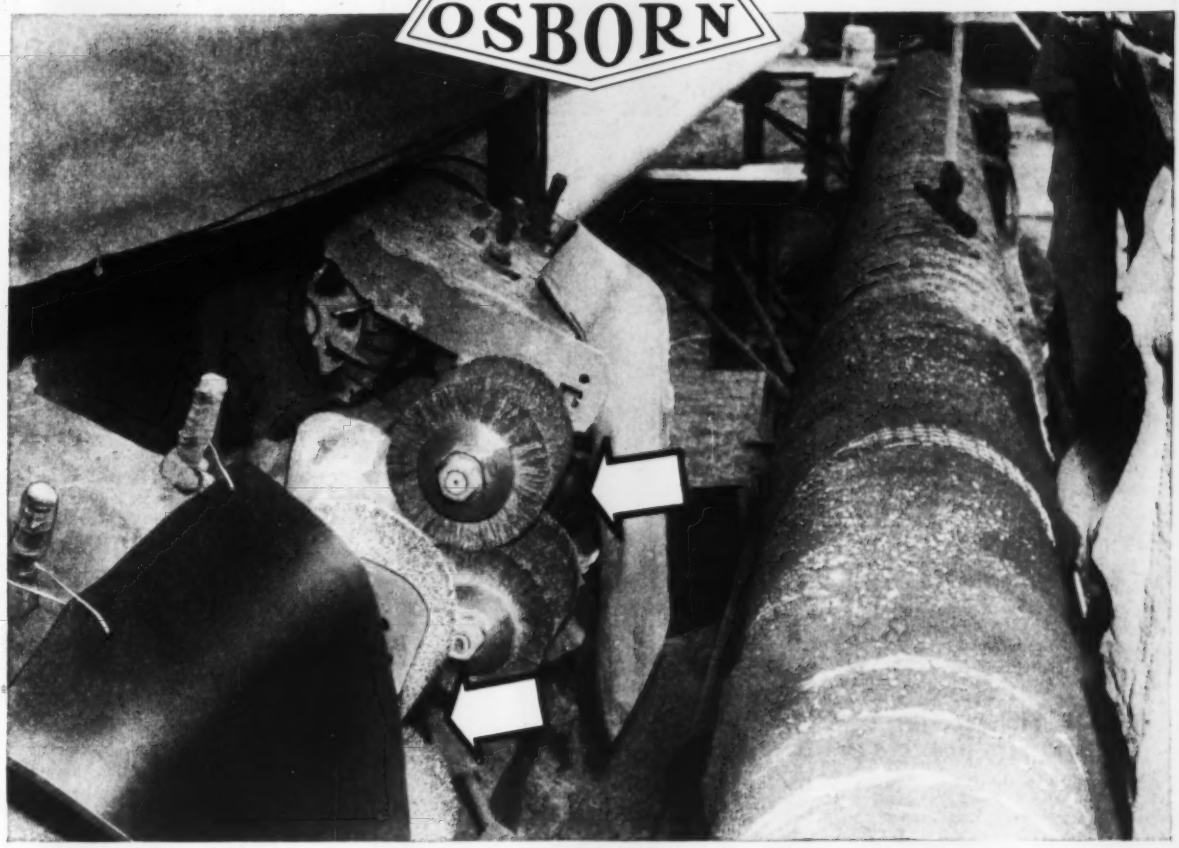
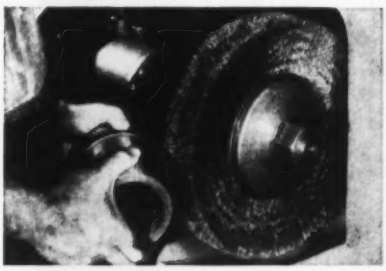
OSBORN



Triples brush life

CAN AN OBA CUT YOUR COSTS?



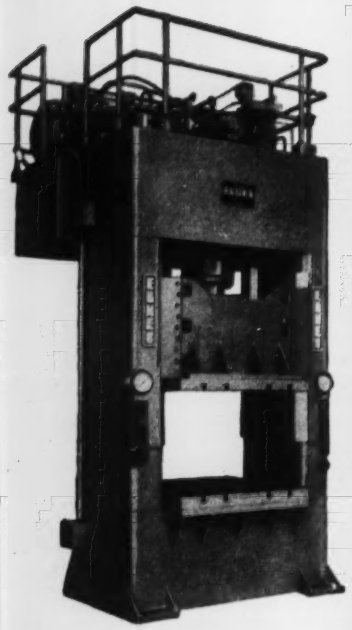
Master of many jobs. *Because it can do so many different jobs, the Master Wheel is one of Osborn's most popular wire brush wheels. It is used extensively for finishing, cleaning, burr and scale removal. Here, it is being used at 3000 rpm to remove scale from a heat-treated part.*

THE wire brush wheels formerly used for coating this pipe with concrete lasted a maximum of 115 pipe lengths. Now, Osborn Master Wheels coat 350 pipe lengths—a 3 to 1 superiority in service life. Longer brush life is typical of results obtained by an **O**sborn **B**rushing **A**nalysis.

Whether your operation is a special job like coating concrete . . . or any cleaning, finishing or burr removal applications, an **OBA** could help cut your costs. Have an Osborn Brushing Specialist analyze your operations and submit a confidential written report to you on how you can benefit with power brushing. An **OBA** costs you nothing. Call or write *The Osborn Manufacturing Company, Dept. G-25, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushing Analysis

TO HELP YOU DISCOVER HIGHER QUALITY AND LOWER COSTS WITH POWER BRUSHING

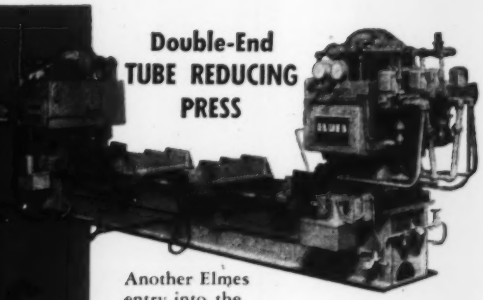


DRAWING AND FORMING PRESS

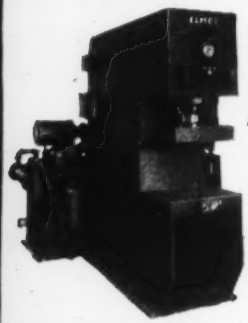
Typical of Elmes soundly designed and constructed hydraulic equipment for metal drawing and forming is the press shown above. These presses are built in single and double-action types (with or without cushion) and in triple-action type. Equipped with push-button controls arranged for semi-automatic or full automatic operation, and inching for die-setting. Rapid traverse to and from work, automatic slow-down, and protection against over-travel and over-pressure. Wide range of pressure capacities, from 50 to 2000 tons or more.

Elmes versatility in the metalworking field is illustrated by the presses shown here—just a few of the many types available. Whatever your job requirements, skilled Elmes engineers are ready at all times to help you solve your hydraulic equipment problems on the traditional Elmes basis of maximum production efficiency at minimum cost.

Double-End TUBE REDUCING PRESS

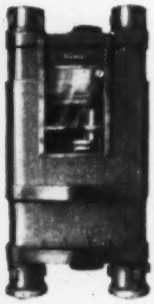


Another Elmes entry into the growing field of *automation*. Fully automatic, including feed, tube ejection, and take-away, and lubrication of tube ends prior to reduction. Press illustrated is designed to accommodate a wide range of tubing lengths.



AUTOMATIC OPENSIDE PRESS

This specially designed press accomplishes in a single stroke the shearing, riveting, and straightening of forged steel work of variable thicknesses. Openside presses available in standard and special designs.

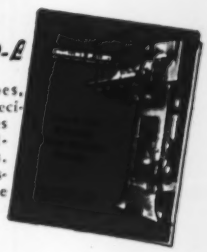


HOBBING PRESS

For die-sinking and hobbing — forming duplicate die inserts, multi-cavity molds, and single molds with unusual contours. Capacities to 5000 tons.

Write for Bulletin 1010-E

Illustrates, describes, and gives major specifications on Elmes Hydraulic Metal-Working Presses. See your Elmes Distributor — or write to us direct.



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ELMES ENGINEERING DIVISION

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This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 135 No. 19 November 8, 1954

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Editorial, Business Staffs—16. Advertising Index—170. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $7.50; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Acceptance under Sec. 34.64 P. L. & R. authorized. Copyright 1954 by Penton Publishing Co.

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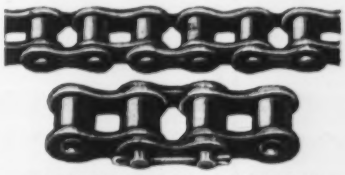
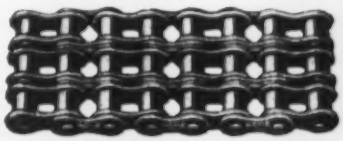
are custom made for
STRENGTH DURABILITY

COMPLETE PRODUCTION FACILITIES AND PROMPT DELIVERY ON ALL THESE CHAINS

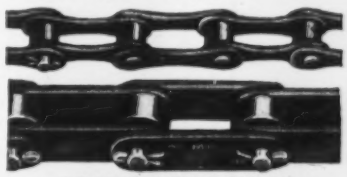
Plus engineering service when required



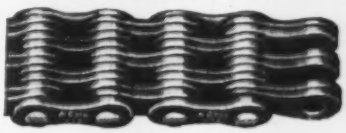
STANDARD ROLLER CHAINS
Available in pitches from ⅜" to 2½" riveted and detachable type.



STANDARD MULTIPLE WIDTH
Multiple widths of six strand or wider available for special application.



DOUBLE PITCH CHAIN
For use in slower speed power transmission and material handling conveyors.



CABLE CHAINS
Acme Cable Chains are furnished in a variety of pitches, widths and strength.

SPROCKETS
Acme Sprockets are available in a wide range of sizes, in all types.

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Write or Phone Holyoke
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Write Dept. 10-O for new illustrated 76 page catalog on use and application of roller chains and sprockets.

Acme Chain Corporation
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Tempilstik°

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looks like a crayon...

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tells temperatures like a precision instrument!

Sixty-three different compositions enable you to determine and control working temperatures from 113° to 2000° F. TEMPILSTIK° marks on workpiece "say when" by melting at stated temperatures—plus or minus 1%.

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behind the scenes

New Parcel Post Annex

Postmaster General Arthur E. Summerfield last week in Cleveland officially dedicated the largest building on earth expressly designed for bulk mail. The occasion was the opening of Cleveland's New Parcel Post Annex, a mammoth structure recently erected near the mouth of the Cuyahoga River. An audience containing notables in industry and government listened attentively while the Postmaster General delivered a highly interesting address.

Representing STEEL were George Hays, President, Penton Publishing Co.; J. W. Zuber, Business Manager, and G. R. Ebersole, Circulation Manager. We tagged along, hoping nobody would notice us, and our hope was granted: nobody did.

Since STEEL will reach you through this new Annex, we thought you would like to know something about it. The word "post" is derived from the Latin "positus", meaning "placed", because horses were placed at certain distances to transport letters or travelers. The words "new Parcel Post Annex" were derived from the fact that the Cleveland Post Office built a new $9 million Railway and Parcel Post Annex on the beach about six blocks away from STEEL's headquarters.

Some Annex!

Designed and engineered strictly for Parcel Post and Railroad usage, it represents the last word in the expeditious handling of bulk mail. You have to walk through it as we did (in the shadow of the Postmaster General and his retinue of congressmen, assistants, public officials, civil servants and a man named Charlie, who confessed that he was looking for the cafeteria) to really appreciate its size and potentials. It's just a little old Annex, 800 feet long, more than half as wide, two stories high, and full of more than 1 million square feet of usable space. Rail accommodations will provide for the handling of 72 storage cars.

Metalworking products are everywhere in evidence, and the names and trademarks of STEEL advertisers gleam from motors, trucks, beams, cables, conveyors and fabrications too numerous to mention. In this connection, let us return to Postmaster General Summerfield:

"This magnificent building, designed 20 years ahead, is a pilot plant that will be copied all over the country. Undreamed of a generation ago, it is now a model of the future. It is not ornate; it is efficient. And best of all, it represents what Government and private capital can do when they cooperate. The New York Central Railroad teamed up with the U. S. Post Office to erect this building. Republic Steel, and Armco, and the city of Cleveland all contributed, demonstrating once again that liberty and communication are partners."

The Postmaster General reminded his audience that in Cleveland alone, postal receipts rose from $2.83 in the first quarter of 1806, to an astounding $25 million in 1953.

So there you are, executives of the Metalworking Industries: other new parcel post annexes (or is it "annices"?) may well be springing up all over the country soon, patterned after the Cleveland structure. Better ear-mark your share of that business.

Bessemer Blew One

About 100 years ago Sir Henry Bessemer toyed with the idea of continuous casting, but so many qualified experts laughed at him, he went back to blowing air through pots of liquid pig-iron, and wondered instead if his invention of a ship with a stationary cabin would get him anywhere. It didn't. When Sir Henry died in 1898 continuous casting was still a dream; it remained a dream until 1954, when it became a reality at Atlas Steel's Ltd., Welland, Ontario.

Associate Editor Tom Hruby watched the first continuous casting operation on this side of the Atlantic with protruding eyes, then rushed back to Cleveland with a still smoking typewriter. His story on page 88 gives the history of the process.

Shrdlu

(Metalworking Outlook—Page 37)

make it of CRUCIBLE stainless steel today

Crucible Rezistal® stainless steel *always* keeps its bright, attractive finish. For stainless has no surface finish to wear or chip away. It's *stainless* all the way through.

Yes, Crucible stainless steel is a beautiful but *practical* metal. That's why you'll find it being extensively used as architectural trim, in food processing equipment, in hospitals, on your car, or in your own kitchen. Actually, you'll find stainless profitably used wherever you turn, for if you can make it of metal – you can make it better of Crucible stainless steel.

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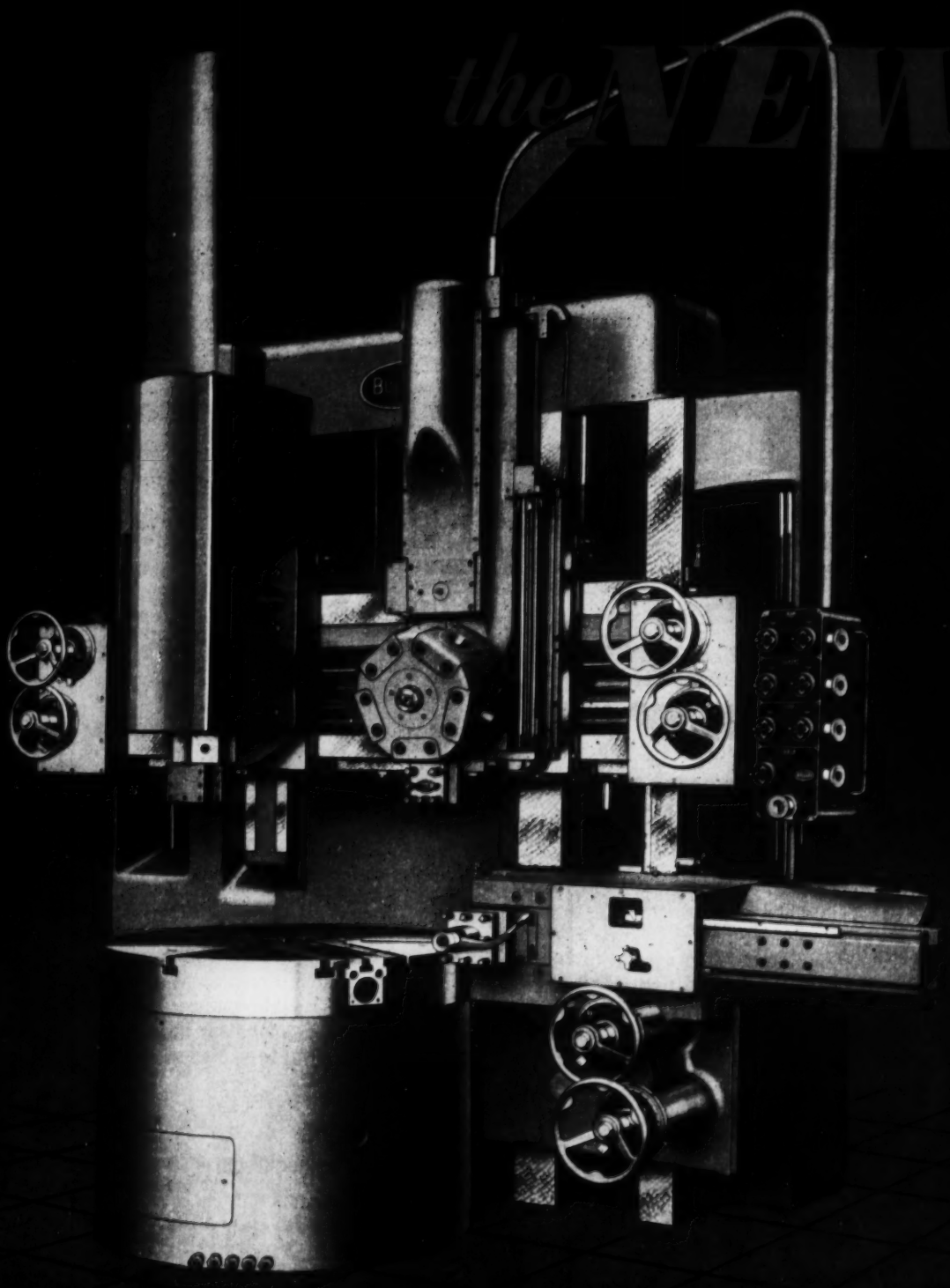


CUT MASTER *Model 75*

A COMPLETELY NEW DESIGN OF VERTICAL TURRET LATHE

This new line has been engineered and designed to take full advantage of the latest improvements in cutting tools, methods and materials. Here are some of its features:

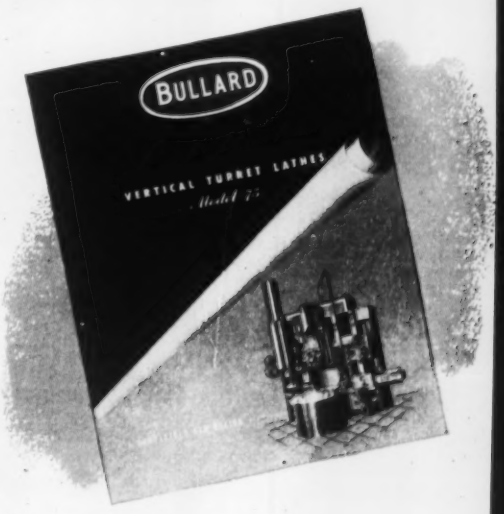
★ **PENDANT CONTROL,** exclusive Bullard design, for maximum machine control from a movable pendant station. Start and stop spindle; selection of speeds, feeds and directional movement of all heads in feed or traverse are quickly and easily accomplished from the Pendant. Interlocks and a stop-all stick provide safety for both operator and machine.

★ **ELECTRIC CONTROL PANEL** – Accessible yet concealed and protected from oil, dust and other foreign matter.

★ **IMPROVED CUTTING COOLANT SYSTEM** – Adjustable conductors with flexible hoses for channeling coolant directly to cutting tools and adjustable heavy gauge steel guards designed for easy chip removal.

★ **POWER INDEXED MAIN TURRET**–(Optional)

Available in 26, 36, 46, 56, 66 and 76 inch sizes for shipment to you early in 1955.



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The excellent flow properties of this superior cold heading wire, together with its structural soundness, enables you to gain greater efficiency from start to finish on the more intricate and precise cold heading parts in your production schedule.

For further information, see your Keystone representative or write direct.

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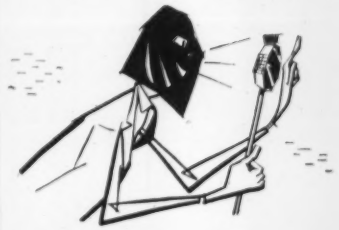
LETTERS
TO THE EDITORS

Secret Admirers of Mirrors



Please send me two copies of each of the articles on company-owned automobile expenses, which appeared on p. 67 of the Oct. 11 issue and p. 60 of the Oct. 18 issue.

Our group was recently surveyed as to what feature (in STEEL) we read most consistently. The answer was unanimous: "Floyd Lawrence's Mirrors of Motordom." He does a more interesting job of covering Detroit than do the magazines specializing in the automotive trade and (with the exception of the MG horsepower flub) hasn't made any obvious errors of fact or omission in the last two years. It's nice to know someone who can combine good literary techniques with accurate engineering reporting. The engineers are usually dull, and the "writers" can't separate personal opinions from facts.

(Signed) F.H.S

• *The above correspondent has requested that his name and his company's name be withheld.—ED.*

This is in reference to your articles on company-owned automobile expenses . . . this subject is of immediate interest to us in view of the large number of cars our salesmen use and which are company owned. May we have a copy of each article . . .

D. L. Bartlett
purchasing agent
Stanley Works
New Britain, Conn.

• *Only a limited number of tear sheets were available on these articles, and the supply is about exhausted.—ED.*

Little Changes: Big Savings

Please send us a tear sheet of your article on p. 98 of the Sept. 6 issue, "Vest-Pocket Automation" (Cost reduction of nearly 90 per cent per part is the result of this small-scale automation . . .).

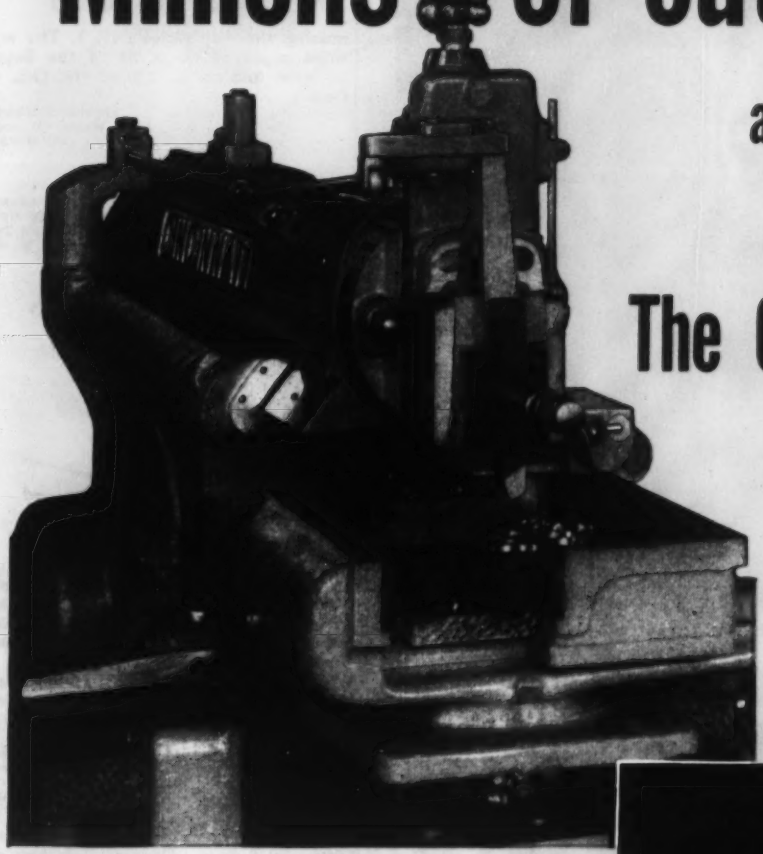
C. S. Iden
International Harvester Co.
Chicago

Routing Out a Troublemaker

Please send me tear sheets of Parts I and II of the article, "Hydrogen: Welding's Big Troublemaker" by Helmut Thielsch of Grinnell Co. Inc. (An expert gives some practical ideas for min-

(Please turn to page 12)

Millions of cuts without a fault...



The CINCINNATI Tool Lifter!

The dependable Cincinnati Tool lifter, with positive return and lift, eliminates tool damage—operates at high speeds—and with angular settings of tool slide or clapper box. Protects and permits use to maximum advantage of carbide or high speed cutting tools.

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Write for Shaper Catalog N-6.

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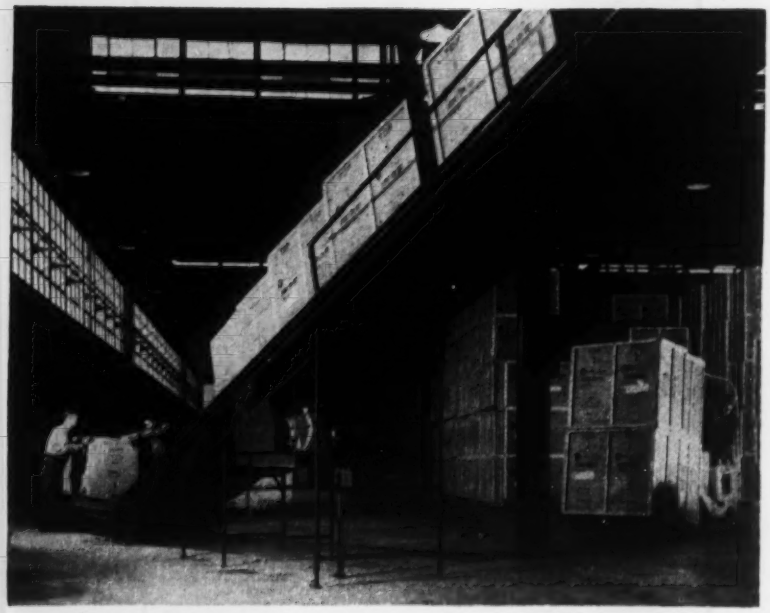
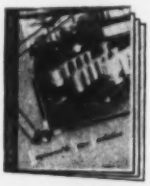


BELT CONVEYERS

one of the many types of high-quality power and gravity conveyers in the MATHEWS Line

The Belt Conveyer is one of the most efficient and commonly applied types of material handling equipment. It can be installed level, inclined, declined, or in a combination of these designs, and will operate well at any reasonable speed under complete control. The full line of Mathews Belt Conveyers ranges from standardized, general purpose units to highly complex, continuous flow conveying systems. When you have package handling problems, call in your nearest Mathews representative. Have him tell you more about Mathews Belt Conveyers and the other types of equipment in the complete Mathews line.



● Write for Bulletin G.P. 53, giving details on the Mathews General Purpose Belt and Live Roller Conveyers . . . or for Catalog No. 853, featuring numerous installations that could possibly offer a solution to your conveying problem. Both are yours for the asking.

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Engineering Offices or Sales Agencies in Principal American and Canadian Cities

LETTERS

(Concluded from page 10)

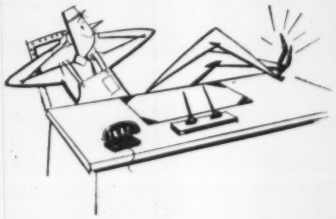
imizing the difficulties . . .). The articles appeared on p. 84 of the Sept. 27 issue and on p. 108 of the Oct. 4 issue.

Michael Darkoch
L. B. Foster Co. Inc.
Pittsburgh

I would appreciate tear sheets . . .

J. Q. Adams
General Manufacturing Unit
International General Electric Co.
Schenectady, N. Y.

Foremen Must Be Managers



We would like to get 12 tear sheets of your article, "The Foremen—Make Them Managers," No. 9 in STEEL's 1954 Program for Management which begins on p. 103 of the Oct. 11 issue.

I believe this is the most comprehensive outline of this subject I have seen anywhere, and certainly every word of it is gospel truth.

Carl L. Hecker
first vice president
Oliver Corp.
Chicago

. . . I think your article is an excellent one, and I want to congratulate you on the use of the material.

Arthur C. Croft
National Foremen's Institute Inc.
New London, Conn.

. . . we'd like to get 200 reprints of the article.

James T. Harrington
E. W. Bliss Co.
Canton, O.

Your article, "The Foremen — Make Them Managers," is excellent . . . Would it be possible to get 1000 reprints?

Dean Sims
National Association of Foremen
Dayton, O.

● *A quotation on covering 1000 reprints has been sent.—ED.*

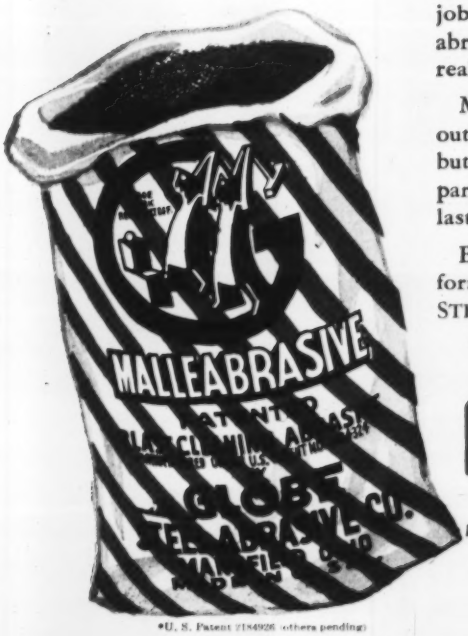
Second Shift Request

I am fortunate enough to be on the list at our company (Chase Brass & Copper Co.) of people who get a chance to see your interesting and informative magazine. But there is a catch. I am the shift foreman (3 to 11) in the sheet mill in Cleveland, and I am not able to use the card which you provide for requesting tear sheets. I would like to get a copy of your article, "The Foremen—Make Them Managers," No. 9 in STEEL's 1954 Program for Management, on p. 103 of the Oct. 11 issue.

Tom Waller
956 Greyton Rd.
Cleveland Heights, O.

● *Glad to oblige.—ED.*

HOW TO PUT THE SQUEEZE ON BLAST CLEANING COSTS



More and more shop foremen . . . superintendents . . . men whose job is getting work out fast at less cost, are replacing their old abrasive with Malleabrasive. And they're finding that Malleabrasive really puts the squeeze on blast cleaning costs!

Malleabrasive cleans perfectly—leaves a gleaming finish. Your output is increased because not only does Malleabrasive clean faster but it saves down-time. And your costs go down . . . you have fewer parts replacements, less maintenance. What's more, Malleabrasive lasts longer, which means fewer abrasive purchases.

But why talk about it? Try it and see for yourself. For more information or the name of your nearest distributor, write to GLOBE STEEL ABRASIVE CO., Mansfield, Ohio.

"If you use metal abrasive, you *should* use Malleabrasive."

MALLEABRASIVE®

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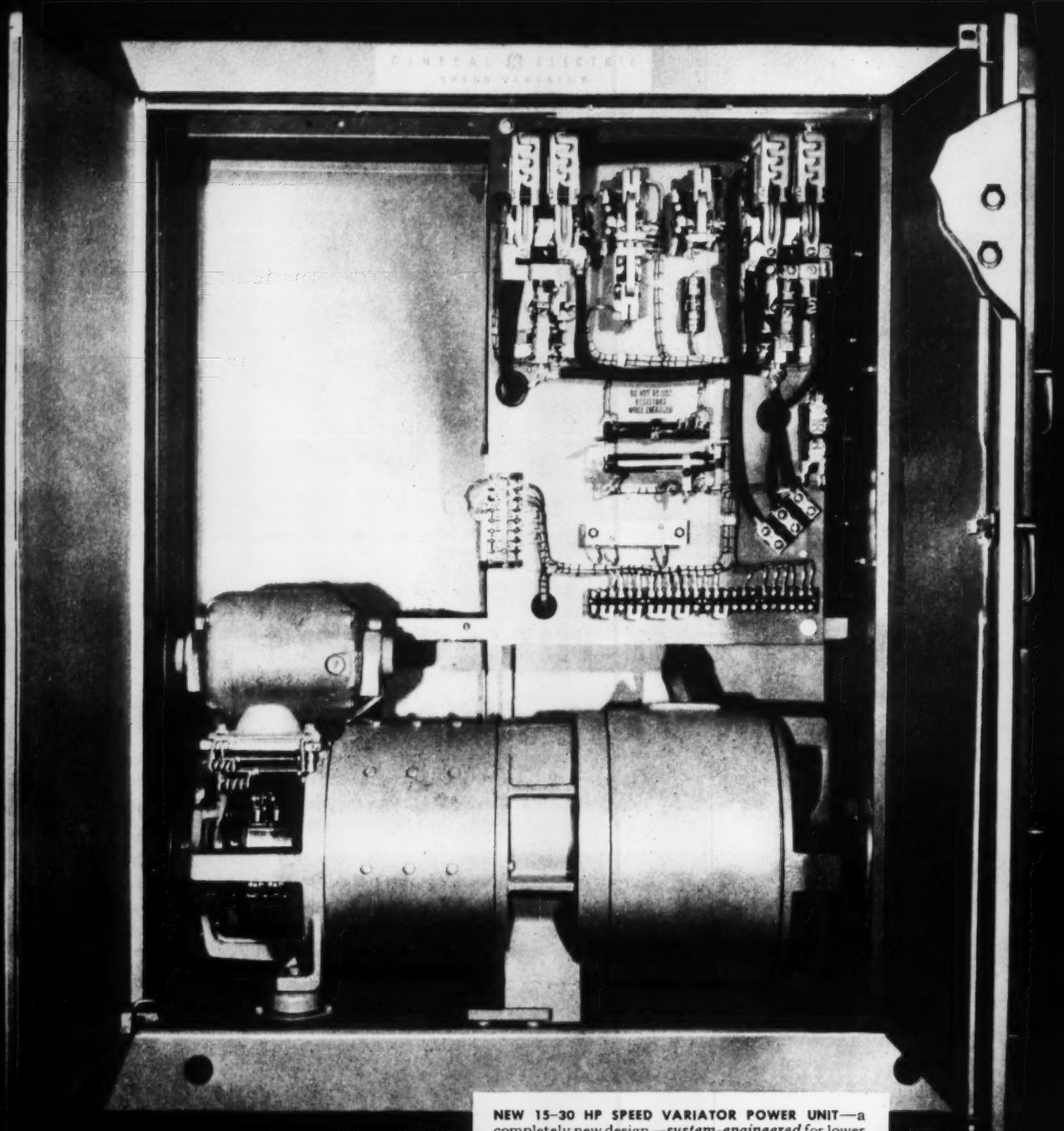
World's largest manufacturers of Malleablized Chilled Iron Shot and Grit
Established 1907

*U. S. Patent 2184926 (others pending)

General Electric Announces



NEW 15–30 HP SPEED VARIATOR POWER UNIT—a completely new design—*system-engineered* for lower installation and reduced maintenance.

GENERAL ELECTRIC

NEW 15-30 hp Speed Variator

Gives you lower installation and maintenance costs— PLUS better adjustable-speed performance.

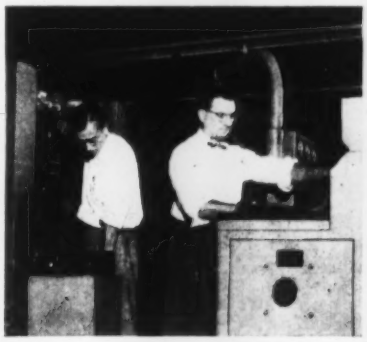
COMPLETELY REDESIGNED, this 15–30 hp power unit is the latest addition to the General Electric Speed Variator line—a packaged, adjustable speed drive—*system engineered* to improve and simplify your machine operation.

NEW FEATURES, designed and engineered to give you lower installation and maintenance costs and more accurate, versatile adjustable-speed performance, are illustrated below.

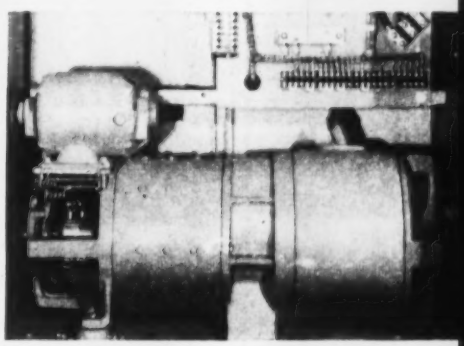
FOR MORE INFORMATION, write Section 822-2 for bulletin GEA-6180 on the 15–30 hp unit, bulletin GEA-6127 on the complete 1 to 200 hp line, or contact your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y. 822-2

LOWER INSTALLATION COSTS

NO SPECIAL FOUNDATION NEEDED for power unit—no bolting down—just a reasonably level space. Fewer conduits to run between components—power unit and operator's control station can be located wherever convenient.

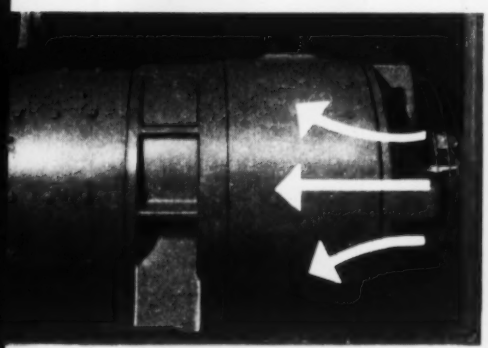


COSTLY SET-UP TIME REDUCED—Every Speed Variator is completely tested and all major adjustments made at the G-E factory. You receive a packaged drive, *system-engineered* for you, ready to install and operate.

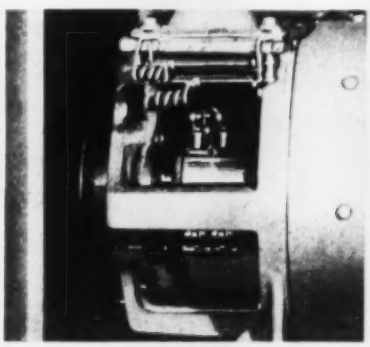


NO M-G SET ALIGNMENT PROBLEMS—All motor generators are factory installed, wired and tested. Set is mounted in cabinet on self-supporting base—three-point suspension on rubber dampers reduces vibration and noise.

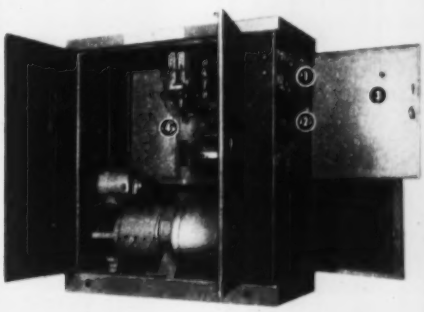
BETTER PROTECTED—LESS MAINTENANCE



POSITIVE PRESSURIZED CABINET assures cleaner operating atmosphere for power unit—large fan pulls air through glass fiber filter, raising inside pressure. Air filters are inexpensive, easily replaced. Removable doors, front and back.



SIMPLIFIED MAINTENANCE—Large handholes and cutback cabinet provide easy access to brushes, commutator and grease fittings. Standard control throughout with color-coded wiring for easy identification and quick maintenance.



BETTER PROTECTED EQUIPMENT—(1) A-c control is in separate compartment. (2) Short-circuit protection inside case. (3) Lockable disconnect switch must be OFF to open a-c door. (4) D-c devices equipped with d-c control for longer life.

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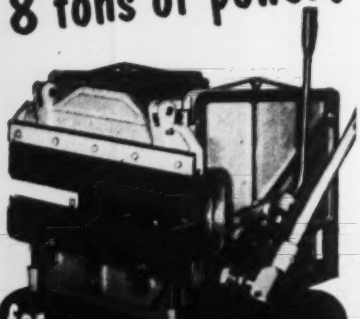
8 tons of power!



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NEW DI-ACRO* PRESS BRAKE

Eliminate tie-up of a large press brake on short-run production jobs with the new Di-Acro Press Brake. It's quickly set up for experimental engineering, too. Hand operated—ample power is provided for average use by a simple cam lever mechanism, plus a power multiplying ratchet drive for heavy forming jobs.

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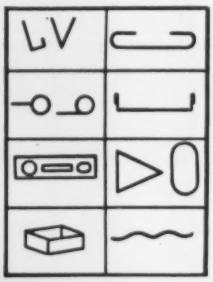

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Send for 32 page catalog . . . contains complete information on Di-Acro hand and power operated Benders, Brakes, Notchers, Punch Presses, Rod Parters, Rollers, Shears, Spring Winders.

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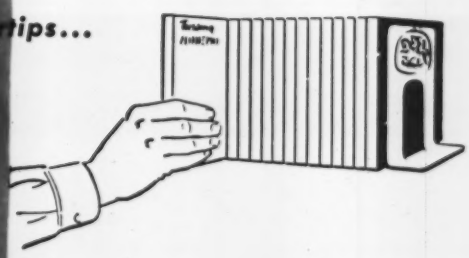

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- **Eliminate additional operations**
- **Reduce metal waste**
- **Save shop time and labor**

Slitting, cutting, shearing, sawing and other specialized operations are money-saving services we offer.

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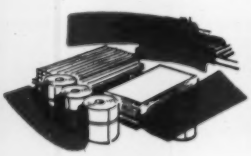

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YOUR PARTNER IN PRODUCTION

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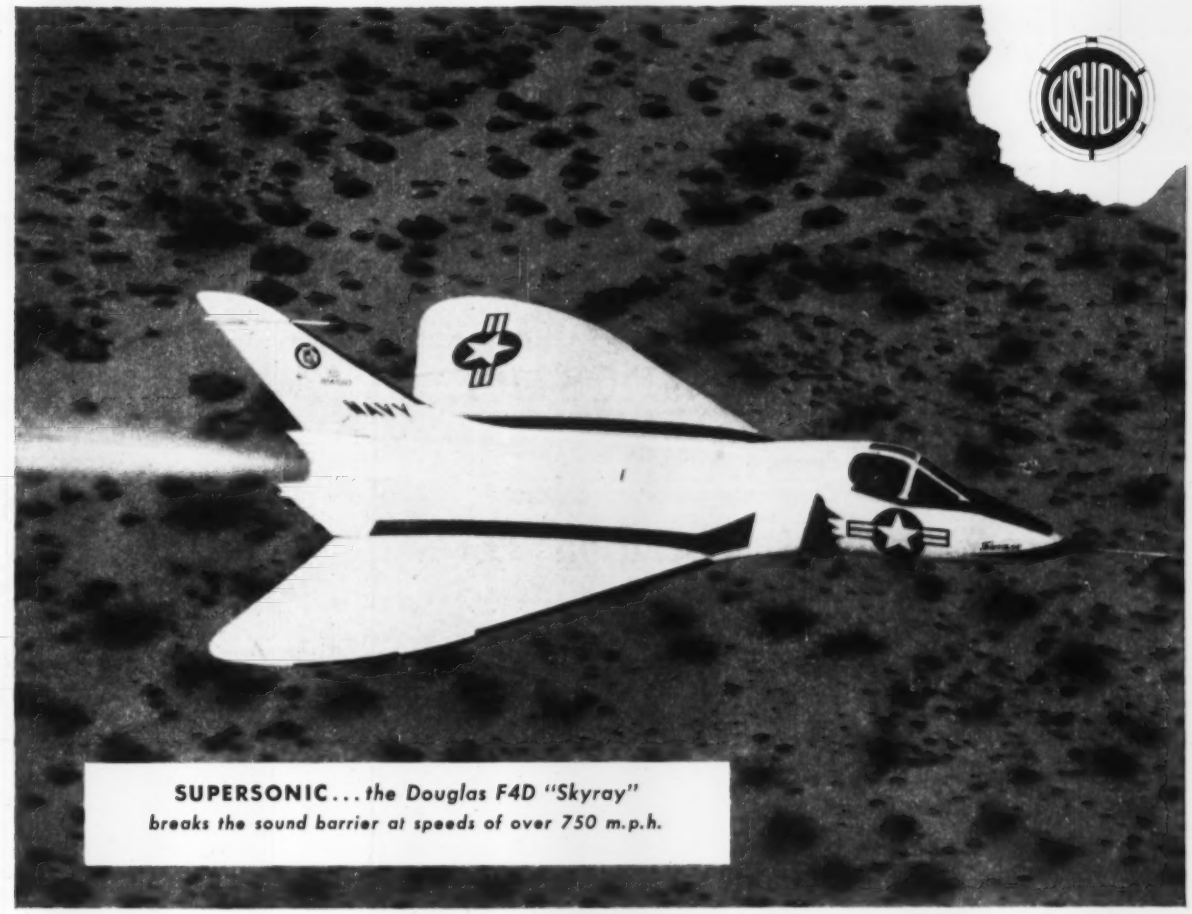


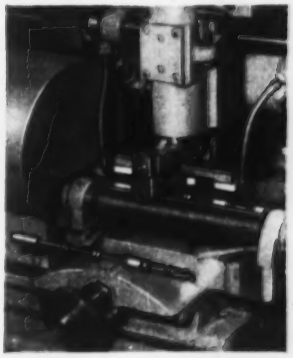
SUPERSONIC... *the Douglas F4D "Skyray"*
breaks the sound barrier at speeds of over 750 m.p.h.

...and GISHOLT SUPERFINISH
breaks another cost barrier!

Do you think of SUPERFINISH as an expensive process? Then it's high time you know the facts.

Here's an excellent case in point... on the record-breaking Douglas "Skyray." Among the most precise parts on this supersonic jet are the slide valves. They're ground from the solid, first on a cylindrical grinder, then on a centerless grinder. Then they're transferred to a Gisholt Superfinisher where the bearing surfaces get a finish of 3 micro-inches, r.m.s. Former time for hand-lapping ran from 2½ to 3 hours per piece. The Gisholt SUPERFINISHER does it in 45 seconds! Think of it: less than 1/200th of the time! And think what that does to costs!

If SUPERFINISH can improve your product, as probably it can, better get the facts. The complete story is in the booklet "Wear and Surface Finish." Ask us for your copy.



Approximate diam. of slide valves (lower left) is ½" with reduced diam. of ¼" between collars, or bearing surfaces. Parts are handled on the Gisholt Superfinisher in only 45 seconds per piece.

THE GISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

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A lot of Ideas

about making seamless tubing

have been worked out

between the STEEL INDUSTRY

and AETNA-STANDARD

in 53 years of association

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Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.
M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.
Societe de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.
Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.
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THE AETNA-STANDARD ENGINEERING COMPANY · PITTSBURGH, PA.

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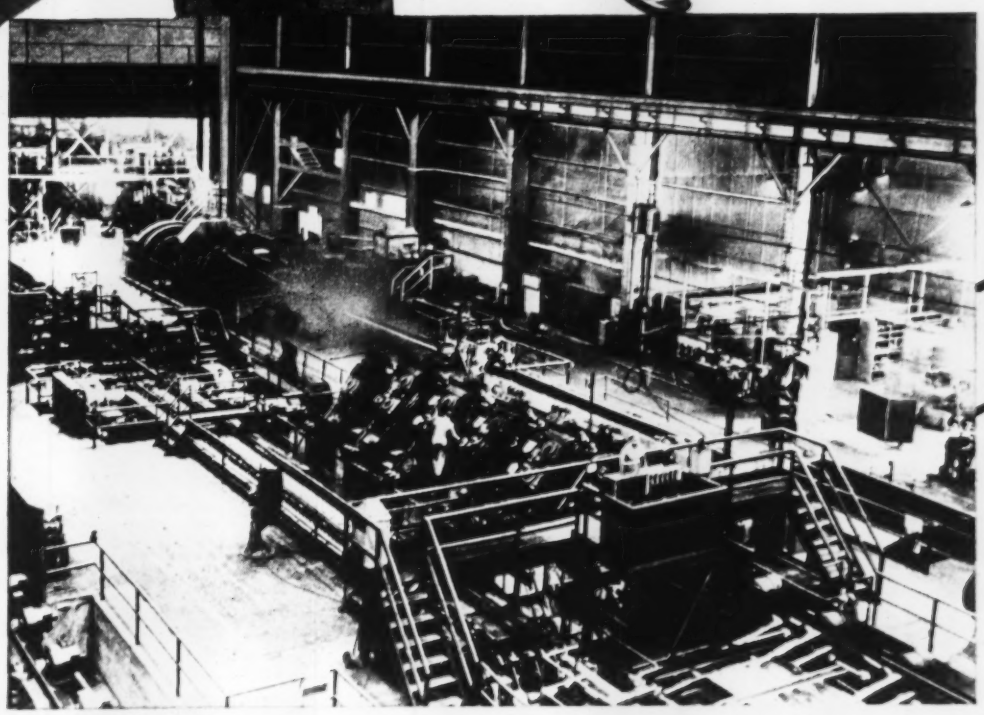
GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

Most of the improvements in equipment for making Seamless Tubing have been worked out between the people who make tubing and Aetna-Standard, who builds the pipe and tube mills. Many times the idea originates with the producer . . . other times with Aetna. Either way, the idea seldom reaches maturity without cooperation of the two. These many years of association have made Aetna-Standard a strong company. They expect to continue to earn steel's respect and confidence by the same combination of brain power and physical facilities.

One of the NEWER IDEAS



The Continuous Seamless Pipe Mill, based on the stretch-reducing principle, has been hailed as "one of the greatest advances in the steel industry during the past 50 years." National Tube and Aetna-Standard worked together several years on this development.

Announcing **a versatile new line of reducers**

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Now, designers can take advantage of the unique double-enveloping worm gear design of Cone-Drive gears in shaft mounted speed reducers. The right angle between input and output shafts offers many application and space-saving advantages over conventional gearing. The reducers are mounted directly on the driven shaft and require only a simple bracket or torque arm to prevent rotation of the reducer.

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Standard reduction ratios range from 5:1 to 60:1. When the motor is connected to the input shaft by means of vee-belts or pulleys, additional speed reduction can be easily obtained. Bore sizes are available to accommodate shafts from 1″ to 2½″ in steps of 1/16″. All sizes are available from stock.

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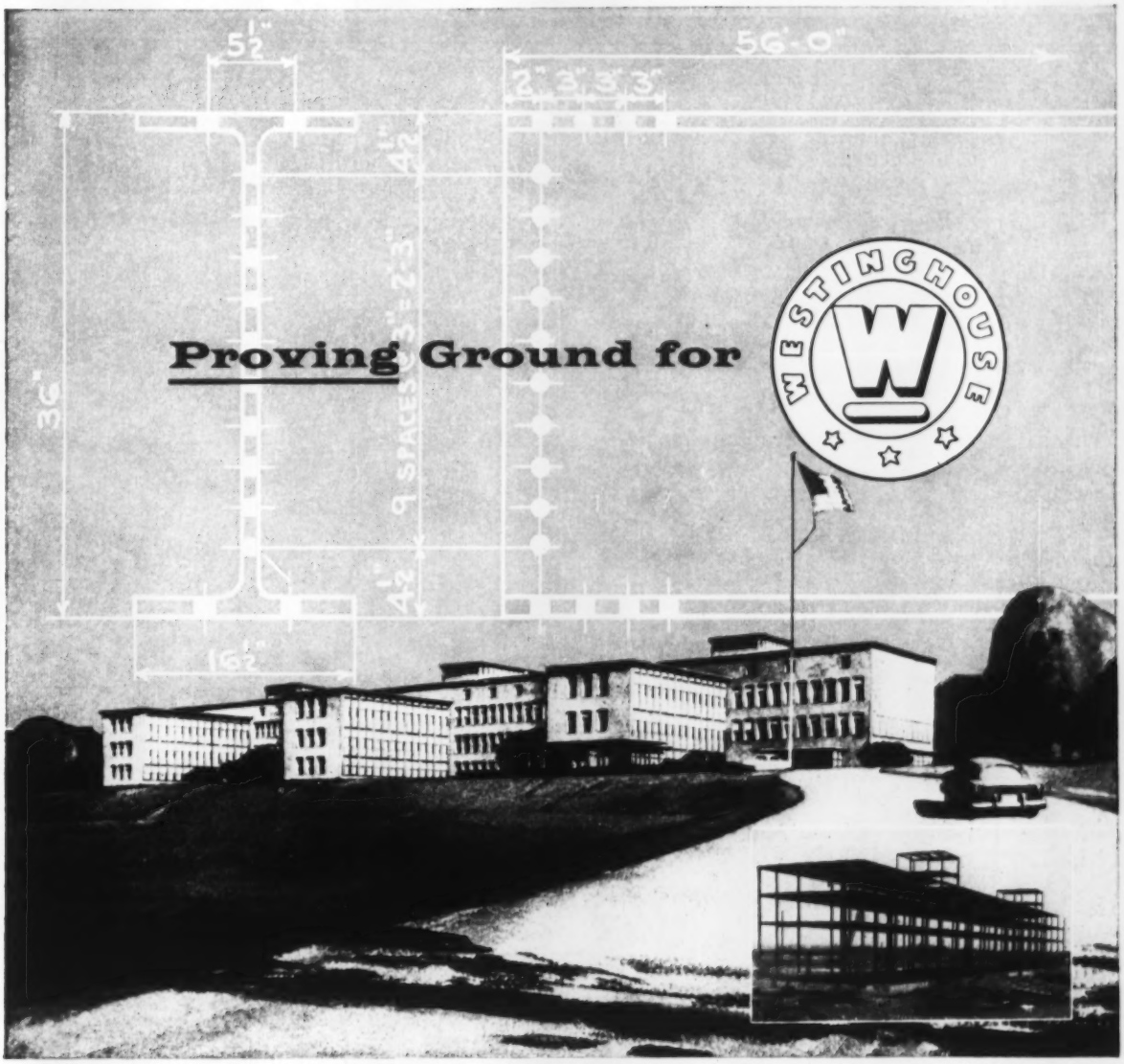

Artist's Rendering of Westinghouse Research Laboratory at Churchill Borough, Pa.

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It's a job that demands *muscles of steel*—rugged wire rope that lifts and pulls the heaviest logs with strength to spare.

We of Wickwire play a big part in furnishing these *muscles of steel* to American industry. Wherever wire rope is used—timbering, drilling, construction, mining, fishing, materials handling—there also you'll find Wickwire Rope helping to do a better, more efficient job. That's the reason for the quality and extra care that go into its making.

every industry benefits from wire rope

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CALENDAR
OF MEETINGS

November 8-11, Wire Association: Annual fall meeting, Hotel Statler, Detroit. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 8-12, Montreal Chapter, American Material Handling Society and Foremen's Club of Montreal: Combined materials handling and tool and equipment show, Show Mart Bldg., Berri Square, Montreal. Information: E. M. Wilcox Ltd., 4585 Sherbrooke St., W. Montreal, Quebec.

November 8-12, National Electrical Manufacturers Association: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

November 10-12, American Management Association: Fall insurance conference, Palmer House, Chicago. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

November 10-12, Industrial Management Society: National time and motion study and management clinic, Hotel Sherman, Chicago. Society address: 35 E. Wacker Dr., Chicago, 1.

November 11-12, Gray Iron Founders' Society Inc.: Annual meeting, The Homestead, Hot Springs, Va. Society address: National City-E. 6th Bldg., Cleveland. Executive vice president: Donald H. Workman.

November 13-16, National Association of Waste Material Dealers Inc.: Pacific Coast fall conference, Fairmont hotel, San Francisco. Society address: 271 Madison Ave., New York 16. Managing director: Clinton M. White.

November 15-17, Association of American Battery Manufacturers Inc.: Annual meeting, Edgewater Beach hotel, Chicago. Association address: 70 Cherry St., Akron, O. Secretary: V. L. Smithers.

November 15-17, American Standards Association: Fifth national standardization conference, Hotel Roosevelt, New York. Association address: 70 E. 45th St., New York. Managing director: Admiral G. F. Hussey.

November 15-17, Magnesium Association: Annual meeting, Chase-Park Plaza hotel, St. Louis. Association address: 122 E. 42nd St., New York 17. Executive secretary: Jerry Singleton.

November 18, National Industrial Conference Board Inc.: General session for all associates, Conrad Hilton hotel, Chicago. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

November 18-19, American Society for Quality Control: Midwest conference, Baker hotel, Dallas. Information: D. B. Tallon, Chairman, 4220 Patricia St., Fort Worth, Tex.

November 18-19, American Zinc Institute Inc.: Fall meeting, Galvanizers Committee, William Penn hotel, Pittsburgh. Institute address: 60 E. 42nd St., New York 17. Secretary-treasurer: E. V. Gent.

November 18-19, National Constructors Association: Fall meeting, International House, New Orleans. Association address: 50 E. 41st St., New York. Secretary: C. B. Bronson.

November 28-December 3, American Society of Mechanical Engineers: Annual meeting, Statler hotel, New York. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

November 29-December 2, First International Automation Exposition: 244th Regiment Artillery Armory, New York. Information: Richard Rimbach, 845 Ridge Ave., Pittsburgh 12.

December 1-3, American Institute of Mining & Metallurgical Engineers: Electric furnace steel conference, William Penn hotel, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: E. E. Robie.

December 1-3, National Association of Manufacturers: Annual meeting, Waldorf-Astoria, New York. Association address: 2 E. 48th St., New York. Secretary: Noel Sargent.

NORTHERN SUPER CRANES • UP TO 150 TONS

Northern Super Cranes—since 1899—have been moving endless tonnages of material in thousands of plants in the United States and other countries. For safety, durability, precise manipulation, unsurpassed electrical equipment, minimum maintenance and maximum dependability in heavy duty service, many plant managers have installed Northern Cranes exclusively.

Write for Bulletins SE-108-A and G-700

NORTHERN HI-LIFT CRANES • UP TO 20 TONS

Northern Hi-Lift Cranes are intended both to supplement Northern Super Cranes in heavy duty service and to provide economical work handling in lighter service. They have the same engineering features as Northern Super Cranes—low design stress for safety—high grade steels, turned and ground shafts and press fits for durability—highest quality electrical equipment and controls for dependable operation.

Write for Bulletin HL-115-R

NORTHERN HI-LIFT HOISTS • 2 TO 15 TONS

Northern Hi-Lift Hoists are heavy duty type electric hoists, designed especially for low headroom installations. They feature heavy duty roller bearings, extra heavy bearing shafts accurately press fitted with bearing races, extra large independent mechanical and electric brakes, and many other elements required in a good investment in hoist equipment.

Write for Bulletin H-112

NORTHERN TRAVELATORS • FOR LIGHT CRANES

The Northern Travelator is a bridge drive unit which can be applied to a hand traveled crane to convert it to power travel. It can be easily installed by your own mechanics and electricians in a few hours time. The roller chain drive facilitates installation and provides longer life and greater ability to absorb the usual impacts of crane service.

Write for Bulletin T-105

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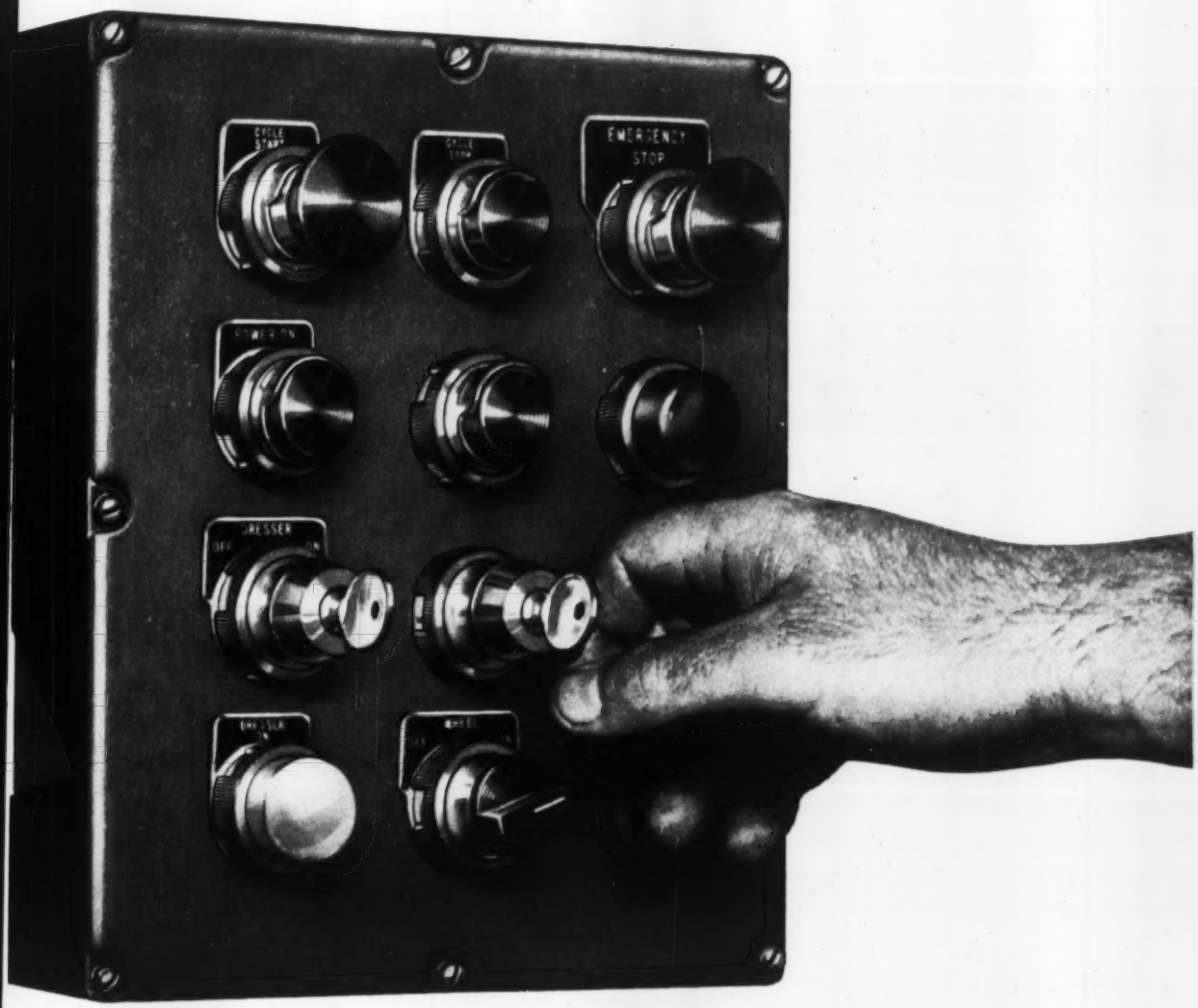
MORSE "Vectormatic Ground" TAPS

with "locked-in" precision



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That's why Morse Vectormatic Thread Grinding is the most precise method in use today . . . and why Morse Taps are now, even more than ever before, your best buy. Call your Morse-Franchised Distributor *now* . . . your only source for Vectormatic Ground Taps.

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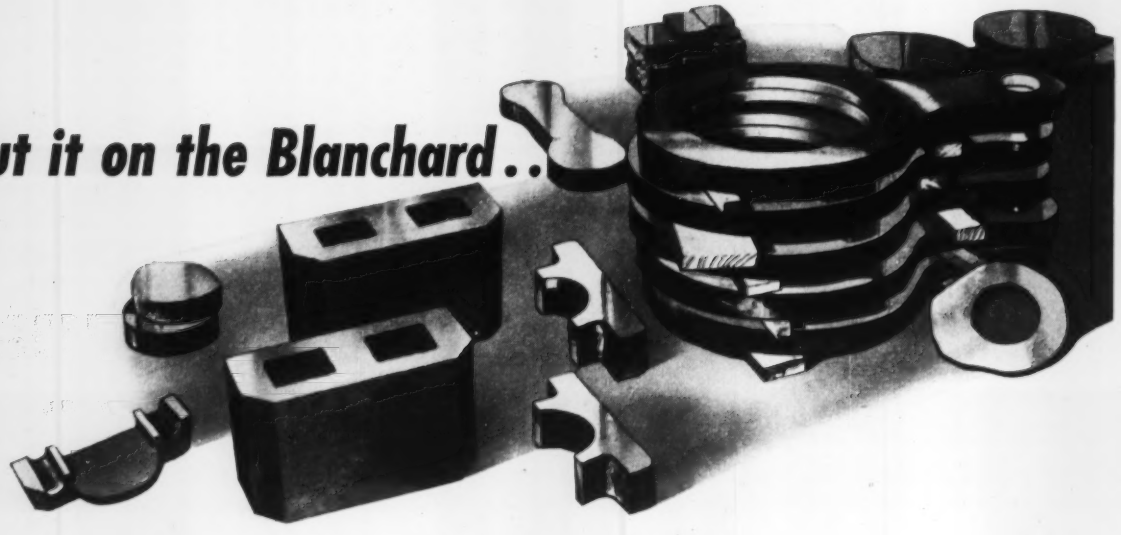

it's versatile! Large and small shops alike find this Blanchard, with 72" diameter magnetic chuck, ideal for fast, precision grinding of miscellaneous work.

it holds multiple small pieces or plates, castings and die blocks up to 80" across corners, directly on the magnetic chuck. Irregularly-shaped workpieces are easily held with simple fixtures. (Custom-built grinders of this type can handle work 30" high.)

it's fast – with a hard wheel, soft steel can be "hogged off" at a rate of 10 cubic inches per minute.

it's precise – with a soft wheel, hardened steel ways are regularly ground flat and parallel to .001", with surface finish of 5 micro inches!

No wonder shopmen say this Blanchard No. 42-72 is "tops for versatility"!

Send for free copies of "Work Done on the Blanchard" (fourth edition), and "The Art of Blanchard Surface Grinding".

PUT IT ON THE BLANCHARD

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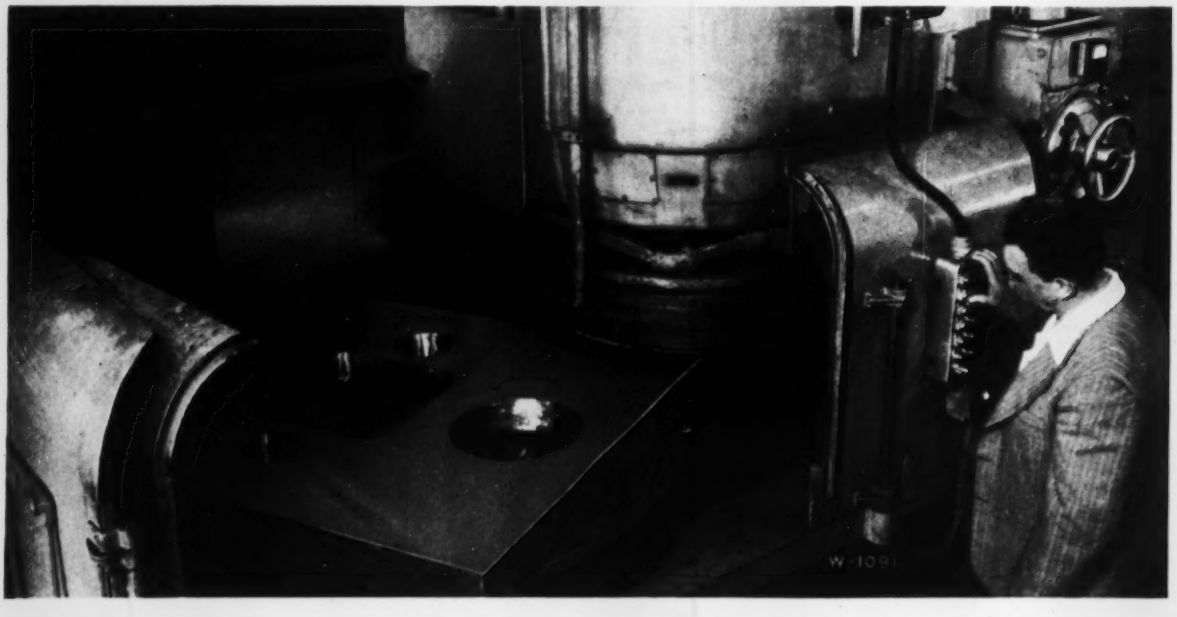

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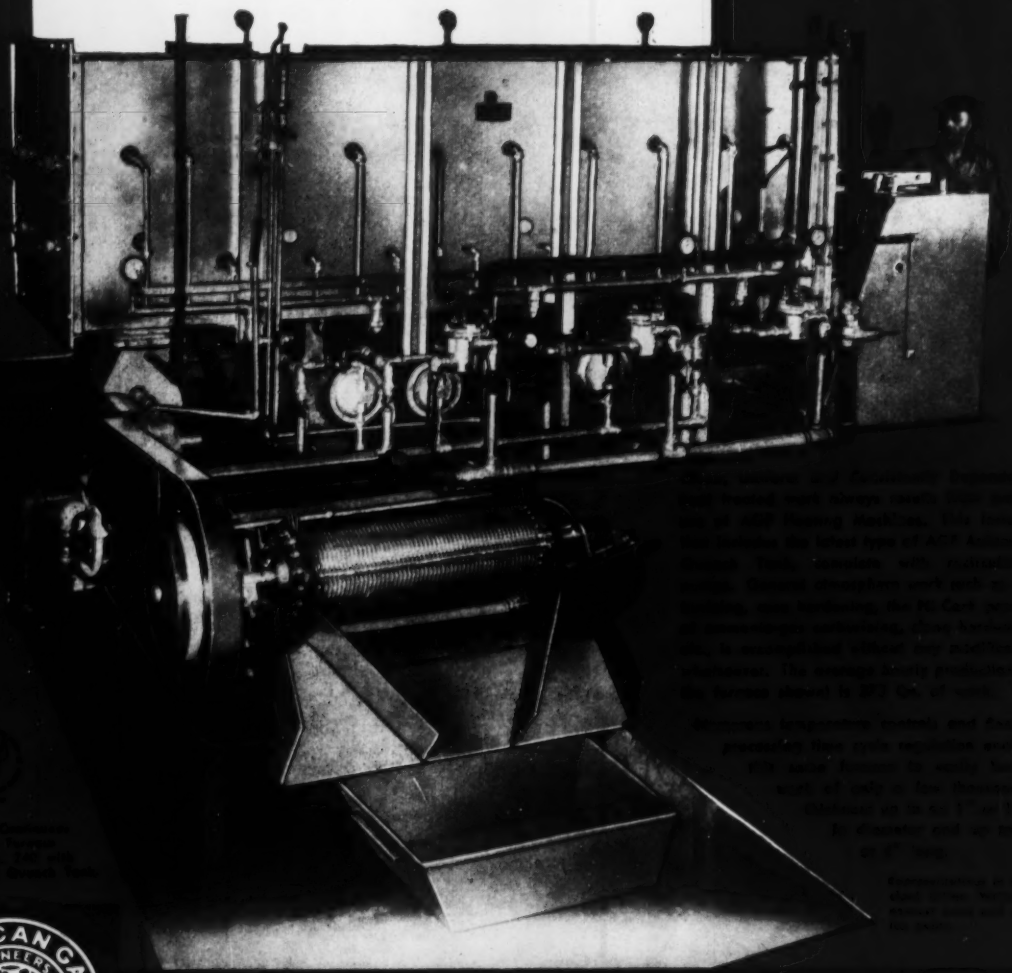

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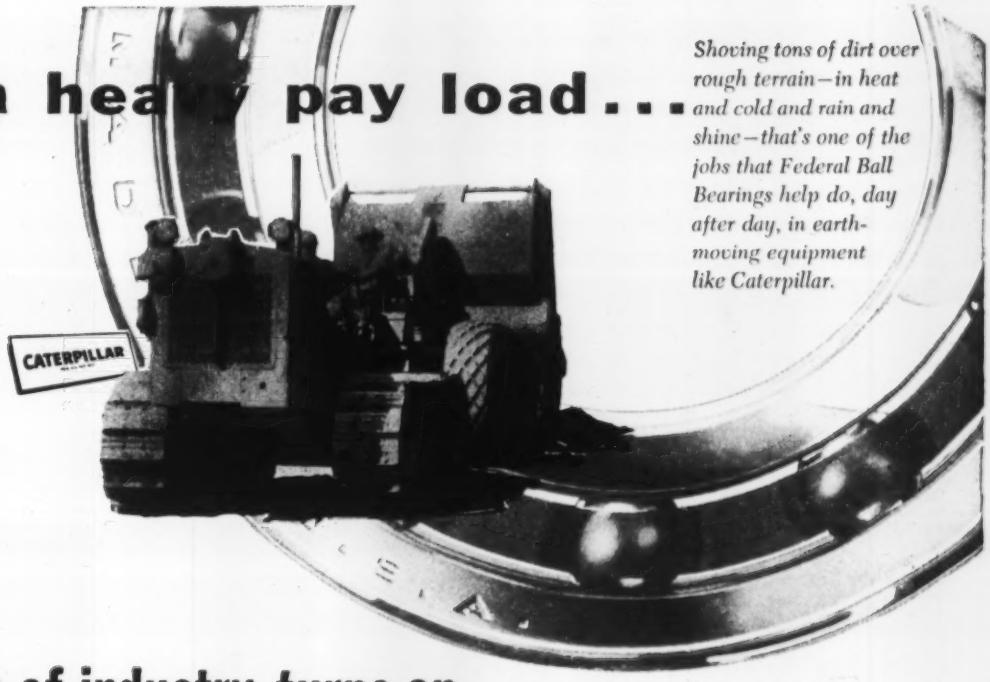

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Shoving tons of dirt over rough terrain—in heat and cold and rain and shine—that's one of the jobs that Federal Ball Bearings help do, day after day, in earth-moving equipment like Caterpillar.

so much of industry *turns* on FEDERAL ball bearings

Out in the open—or in on a desk—out on the road or up in a plane—the chances are you'd find Federal Ball Bearings quietly and efficiently at work—in some of the hundreds of types and 12,000 sizes this 50-year-old company is currently producing. When Federal Ball Bearings are a part of so many things you *use*, why shouldn't they be a part of the things you *make*?

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Business counts on business machines to keep working smoothly with little or no attention—one reason why so many business machine makers like IBM count on Federal Ball Bearings.

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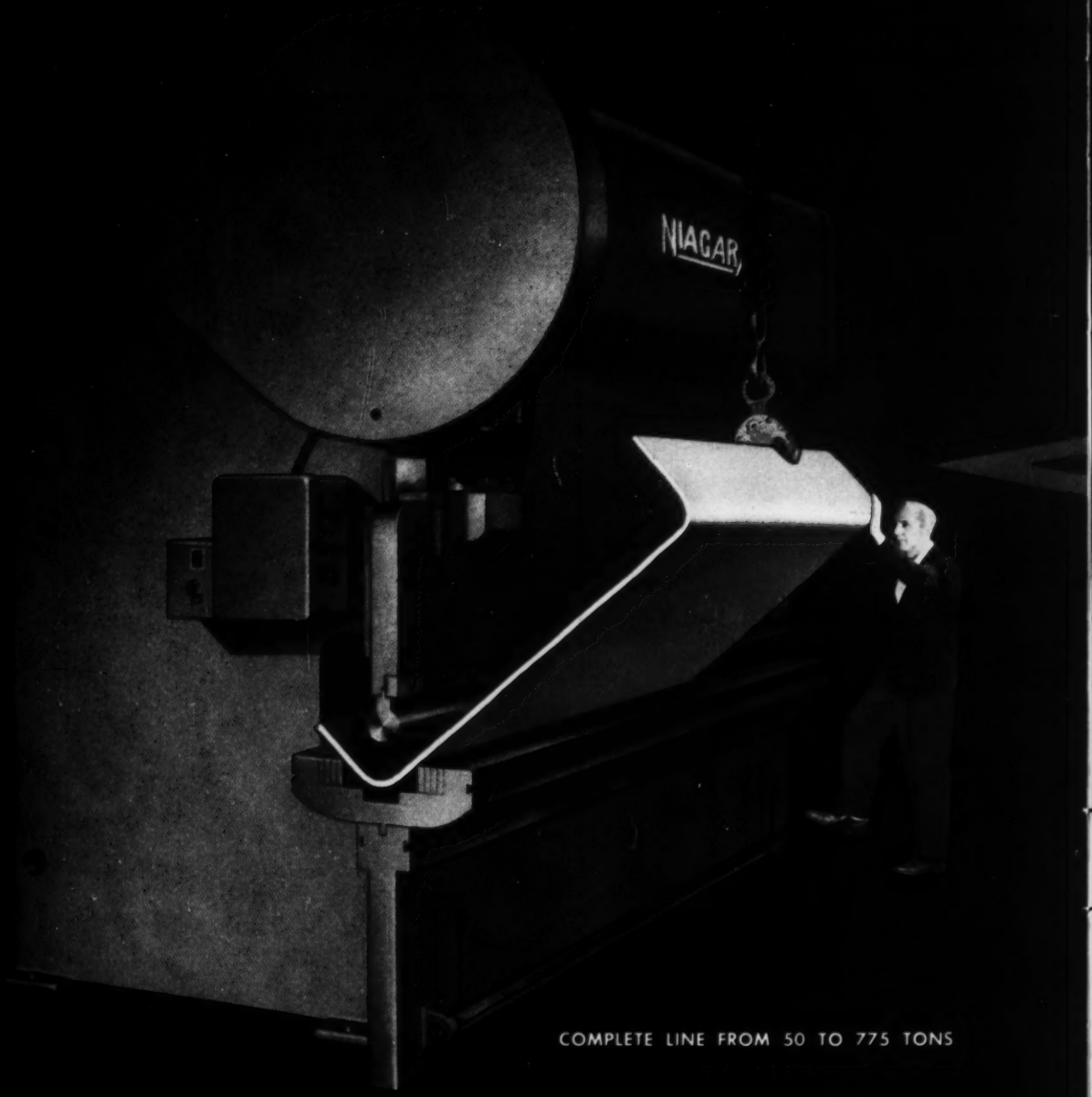
IT'S THE NEW, "YEARS-AHEAD" LINE ..

Far out front on every point of comparison



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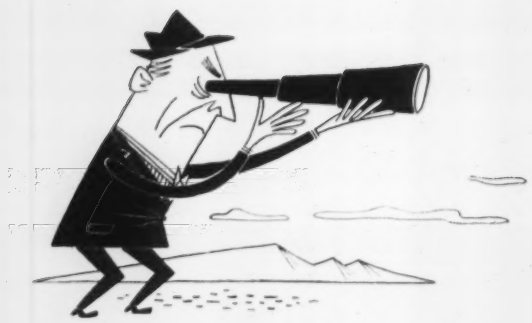

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Frequent check-ups *prevent* emergencies . . . protect your instrument investment. The economical way to do this is a Periodic Service Contract, which brings a Honeywell man to your plant at regular intervals to inspect, clean and adjust your instruments and controls. Your local Honeywell office will be glad to give you full details, and to arrange a custom-fitted contract for your requirements.

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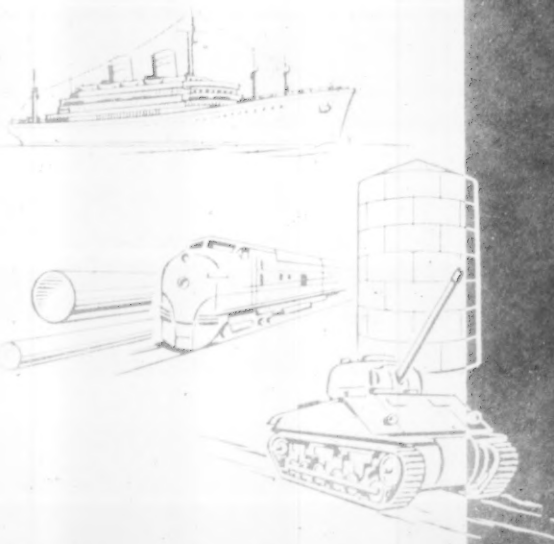

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You get *all* your requirements in *any* quantity when you call Ryerson for bars, shapes and plates. You also get steel of sound, known quality and steel service know-how that makes your job easier.

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Need *plates?* You get them here up to 10 inches thick. And shops which have had difficulty forming A-7 quality plates will be glad to know that Ryerson now carries plates of forming and welding quality.

The completeness of these stocks enables you to combine all your carbon steel requirements on one order for lower prices under the Ryerson quantity differential plan and for lower freight rates. So, whether you need a single beam or a carload, call Ryerson for immediate delivery from the world's largest stocks.

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STEEL
November 8, 1954

Metalworking Outlook

Politics and Business

Last Tuesday's election results won't affect business much one way or the other over the next 12 months. The business upturn started before Nov. 2, and even then Democratic gains were widely expected. Large construction spending, rising defense outlays, improved steel operations and high personal earnings and savings will bulwark the economy sufficiently next year to withstand shifts in political props.

Military Awards Climb

Look for increased military outlays in the coming months. The Defense department placed $4.9 billion in contracts from July 1 to Nov. 1. The Navy awarded $2.1 billion, the Air Force $1.5 billion and the Army $1.3 billion. More than half the total $4.9 billion is for aircraft equipment and supplies. That's because of the Air Force awards and because nearly $1.3 billion of the Navy's contracts are for aircraft.

More Power in Industry

Industrial use of electrical power will annually total some 360 billion kilowatt-hours by 1964, about double today's usage. General Electric Co.'s William V. O'Brien believes that automation will play a vital role in the continuing electrification of industry and the increasing horsepower per worker. Over 90 per cent of that horsepower will be electric by 1964, he estimates.

Needed: Better Wiring

America needs a $20-billion electrical modernization job, says Don B. Clayton Sr., president of National Electrical Contractors Association. He believes that in homes alone fewer than 2 million of the 47 million residential units in the country have anything approaching sufficient wiring capacity. New home appliances during the next five years will require an additional 20 million kilowatts to operate them. The present average annual domestic power use of 2500 kilowatt-hours will more than double in the next decade.

Capital Outlays: Still Good

You can expect new plant and equipment expenditures to hit $26.7 billion in 1954. That's off 6 per cent from the record $28.4 billion in 1953, but it's still the second best total in history. And 1955? Probably on a par with 1954. Plant expansion will slip next year, but equipment outlays, particularly for electrical apparatus, will rise.

Old Question: New Answer

What's the break-even point for the steel industry? A hint of an answer to that ancient question comes from William M. Akin, president of Laclede Steel Co. The steel industry can operate at 70 per cent of capacity and maintain a sound economic level each year, he told the Rail Steel Bar Association. The 30 per cent leeway allowed between that proper operating per-

Technical Outlook—p. 87 Market Outlook—p. 141

centage and full capacity, he maintains, provides for needed replacement and maintenance of production equipment and the assumption of extra loads when necessary. Such a leeway, not present in the previous planning for the industry, will supply the steel needs of our nation in the future even under conditions of stress without disrupting raw material supply and transportation.

Watch Those Budget Cuts

"Too often when budget problems develop, management decides to cut advertising, sales promotion, market research and public relations expenditures," says Ray R. Eppert, Burroughs Corp. executive vice president. "That is a short road to economic suicide because those expenditures, while somewhat intangible in immediate results, are essential if we are to produce the necessary maximum revenue."

NLRB on the Hot Seat

The National Labor Relations Board may find itself on an even hotter seat than usual. Its confirmation of an announced intention to limit its jurisdiction is arousing a storm, particularly from the two Democrats on the board and other Democrats. NLRB, by a 3-to-2 vote, ruled that it won't consider complaints involving companies with less than a certain gross income—$100,000 in one case, $500,000 in another—even though the firms engage in interstate commerce. The object is to cut the board's case load by about 10 per cent in an area involving only about 1 per cent of the employees previously covered. Many claim that Congress alone has the power to limit or expand NLRB's jurisdiction.

Straws in the Wind

Defense Mobilizer Arthur Flemming says that orders will be going out "shortly" on the $40-million elephant tool buying program . . . Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. are still negotiating for a merger despite frowns from the Justice department . . . Washington will publish nickel requirements, compared with supplies available, about Nov. 20 . . . Ford Foundation won't sell its Ford Motor Co. stock now—1953 assets of the company were $1.9 billion . . . When the hullabaloo about the sale of Follansbee Steel Corp. dies down, the deal will probably go through as originally planned.

This Week in Metalworking

A CIO-AFL merger—if it comes—wouldn't have much effect on industrial relations at the company level for the short term (p. 45) . . . Want a management answer to the guaranteed annual wage? (p. 46) . . . Harder selling and a record number of new products were displayed at the Metal Show (p. 47) . . . Metalworking earnings will rise after an indifferent third quarter (p. 48) . . . The long-term prospects for conveyor sales are excellent (p. 49) . . . Pacific Tube Co.'s Carl A. Tillia moves up from the ranks to become plant superintendent (p. 55) . . . Machinery exports are down, but not alarmingly (p. 56).

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Conquers Heat, Erosion and Corrosion. Stainless steels containing nickel lengthen life expectancy of various components used in severe service. For instance, Diesel engine turbocharger rotors. Some rotors operate at from 12,500 to 21,000 r.p.m., and at temperatures upward of 1000°F. The rotor comprises a slotted disc of chromium-nickel stainless steel, with inserted blades of the same material . . . to take the brunt of attack in converting heat into mechanical power. Type "19-9" stainless, containing molybdenum and tungsten additions, is used to make sure of high tensile strength and low creep at the high temperatures encountered. And a somewhat similar austenitic chromium-nickel stainless steel . . . 18-8-S-Mo . . . is used for turbine nozzle blades.

STAINLESS PROVIDES THE ANSWERS . . .

Thousands of designers and engineers have found austenitic chromium-nickel stainless steels to be the key to new high standards of product performance and minimum operating costs. You, too, may find that a stainless steel containing nickel will help solve *your* metal problem.

1. At Elevated Temperatures

Stainless steels of this type possess the two essential qualities for successful use at elevated temperatures. By virtue of the chromium content, and assisted by the nickel content, they have outstanding resistance to scaling and oxidation. The nickel content also results in high creep strength and stress-to-rupture properties. Combined, these properties permit use of chromium-nickel stainless even in thin sections required for lightweight design.

2. At Sub-Zero Temperatures

Experience has shown that unalloyed steels become embrittled rapidly as temperature is lowered below normal. Nickel is by far the best alloying element to prevent brittleness. At sub-zero temperatures, chromium-nickel stainless steels provide unsurpassed impact values. These steels retain such a high level of toughness that they are known to be useful at temperatures as low as —400°F. and possibly even lower.

3. Under Corrosive Conditions

Selection of exactly the right alloy for your specific needs may be made from some thirty alloy steels qualified to carry the family name "Stainless." By virtue of their strength and resistance to attack by chemicals and atmospheres over a wide range of concentrations and temperatures, these austenitic chromium-nickel steels assure not only longer life of the equipment and purity of product, but also permit decrease of bulk and deadweight without sacrificing safety.

4. Where Erosion Is A Problem

Chromium-nickel stainless offers the utmost in resistance to erosion and cavitation. By cold working, it is possible to increase the tensile strength to as much as 300,000 psi. When subjected to erosion, the erosive media work hardens the surface and, correspondingly, curbs the attack. This resistance to erosion combined with corrosion resistance results in prolonged life for equipment made from the chromium-nickel stainless steels.

5. Use *Stainless* To Meet Complex Requirements

Utilize the unique combination of properties provided by chromium-nickel stainless steels when designing new products or improving old ones. You can draw, spin, forge, weld, solder, punch, shear or bend chromium-nickel stainless steels. Leading steel companies produce these austenitic alloys in all commercial forms. A list of sources of supply will be furnished on request.

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

November 8, 1954

Still in Doghouse

For several weeks before the Nov. 2 elections, some executives in industrial and financial circles were inclined to adopt a more cautious attitude toward forward business commitments until election results were known. Probably this discretion was prompted by the knowledge that in seven of the last eight midterm elections the political party in power lost an average of forty-odd seats in the House and an average of four or five seats in the Senate.

At this writing the election returns are incomplete, but it looked as if the Democrats would have a House majority of about 20 seats. The race for control of the Senate was close. At any rate, the losses suffered by the Eisenhower party in power will be much less than the average of recent midterm elections. Possibly the stock market considered this to be a factor favorable to business, because in moderately active trading Wednesday morning many industrial shares advanced by a fraction up to several points.

Thus it may be assumed that the result of the voting will not affect business confidence unduly. However, there is nothing in the returns that can justify complacency on the part of business, financial and industrial leaders. On the contrary, there are numerous details that should cause every thinking person to be concerned about our country's future.

One of them is the increasing use of class hatred as a political weapon. In several important campaigns, the main issue seemed to be based upon the candidates' attitudes toward business. Too many politicians in both parties and too many leftish-minded labor union spokesmen try to capitalize on the assumption that a candidate who favors business must necessarily be antagonistic to the interests of "labor" and the people at large.

American industry still has a monumental job to do in combating this all too prevalent idea that there is something inherently bad about business. In spite of intensive public relations, industry still remains in too many doghouses.

A job to be done before 1956.

E. C. Shaner

EDITOR-IN-CHIEF

PROGRESS IS TERRIFIC: Thousands came away from the 36th annual National Metal Congress and Exposition in Chicago last week (p. 47) with the feeling that the affair demonstrated rather spectacularly the present speed-up in technological progress. There have been

times in the more than three decades of history of this important convention and show when the discussions and exhibits of a current year differed only in minor degree from those of the previous year or two. In short, progress was somewhat sluggish.

This is not true today. In fact, since the end of World War II the pace of technological progress has been speeded up tremendously. This was demonstrated time and time again in Chicago last week. For instance, one exhibitor displayed $200,000 worth of titanium. Another showed magnesium in new forms. Still others showed new alloys, some of which resist higher temperatures than has been possible before.

Few of these exhibits could have been displayed a year ago or two years ago. The pace of progress is terrific.

REKINDLE SCRAP FEUD: In the first eight months of this year, exports of iron and steel scrap totaled 684,861 net tons, compared with 303,723 in all of 1953. Licenses issued this year call for the export of 1,675,000 net tons of ferrous scrap. Department of Commerce spokesmen estimate total exports for the year will be 1,200,000 net tons.

Chief importers of United States iron and steel scrap during the first eight months of 1954 (p. 155) are: Japan, 274,918 net tons; Mexico, 159,851; Yugoslavia, 42,543; United Kingdom, 39,740. Spain, Canada, Austria, Argentina, West Germany, Belgium and Italy import tonnages ranging from 30,000 to 10,000.

The sharp increase in the export of ferrous scrap has brought back to life old arguments that have raged off and on for several decades. Generally speaking, steelmakers and foundrymen frown upon mounting exports of scrap, while scrap dealers and brokers contend that a certain balance between export and domestic consumption of scrap is good for the nation.

AIR PROS AND CONS: Of course, the upturn in exports of scrap was a natural economic development. Shortly after government controls on the export of scrap were relaxed last Apr. 1 (p. 155) steel output in the United States was declining, and in some foreign countries, it was rising. With domestic consumers virtually out of the market, it was natural for scrap to gravitate to the consumer points where it was needed.

Understandably, steelmakers and foundrymen wince at every ton of scrap that goes out of the country. It depletes our reserve of metallics, and it stiffens the price of domestic scrap. With equal understanding, scrap people must not be criticized for seeking foreign outlets when the domestic market languishes. In fact, there is something in the argument that anything that keeps the scrap collecting machinery more or less intact in time of distress is advantageous to domestic buyers of scrap in the long run.

PIONEERS IN CANADA: Every new process has to run the gauntlet of scoffers. For some years the dreams, hopes and ambitions of the exponents of continuous casting of steel have been heckled by skeptics. Today, the operation of a plant in Canada which bypasses ingot teeming and stripping areas, eliminates soaking pits and blooming mills and much other expensive equipment, is causing steelmakers to take a new look at continuous casting.

The pioneer in continuous casting in the Western Hemisphere is Atlas Steels Ltd., Welland, Ont. Here (p. 100) metal from arc furnaces is poured into special ladles, from which it flows through funnels into a copper mold. From this point, the metal—gradually cooling—descends to a point where it is converted into slabs, which can be cut to lengths for finishing.

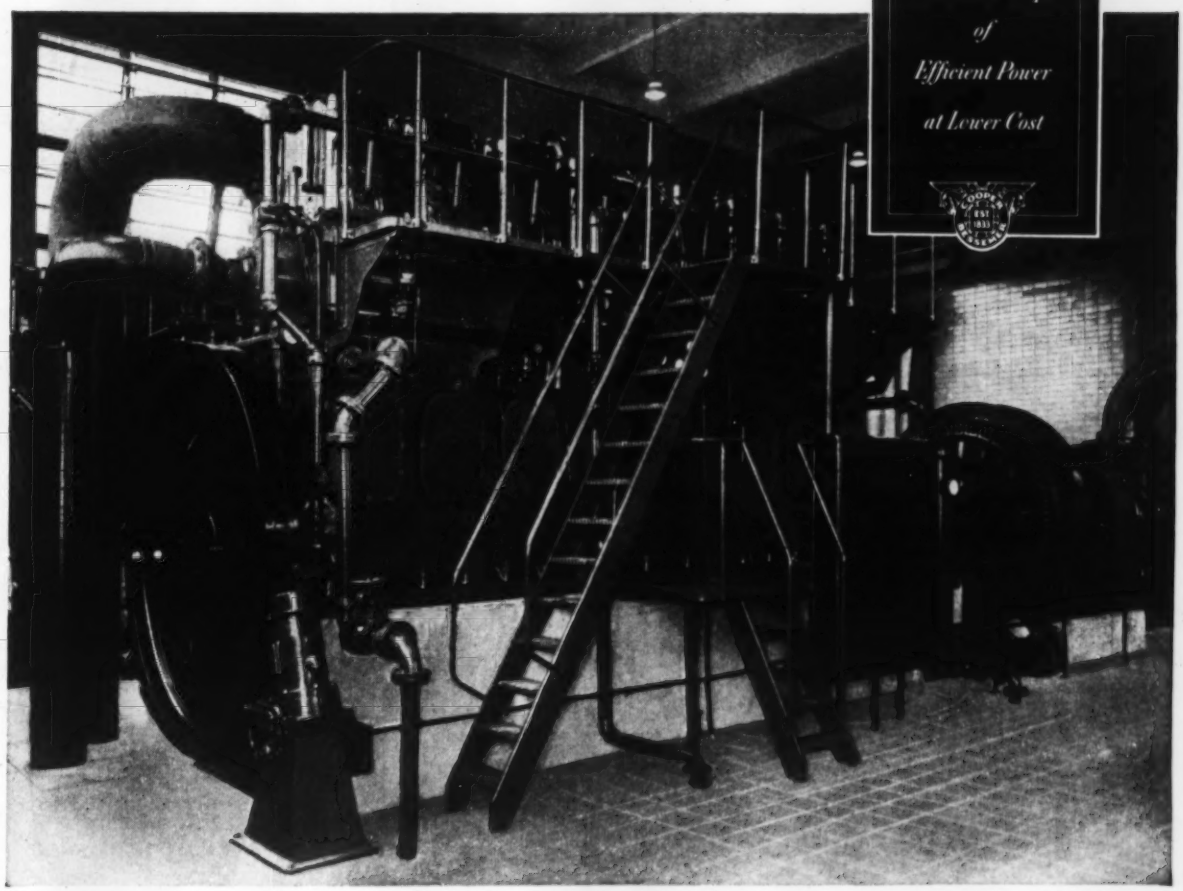
AID FOR SMALL PLANTS: In the final analysis, the future of the continuous casting process will depend upon simple economic criterions. Most competent persons working with its development do not look for a dramatic revolution in steelmaking technology. Instead (p. 88) they foresee a gradual development in which producers of tool, stainless and alloy steels may capitalize on the advantages of continuous casting.

One consultant makes this point: To justify steel ingot operations one must have an annual output of at least 300,000 tons. He contends that with continuous casting an operator can make a satisfactory profit on an integrated mill of "no more than 50,000 tons per year."

A pertinent question is to what extent will continuous casting offer new opportunities to prospective small primary metal producers.

One of four 900 hp Cooper-Bessemer gas-diesels in new Hunts Point sewage plant designed by Greely & Hansen, Chicago.

Another Example of Efficient Power at Lower Cost



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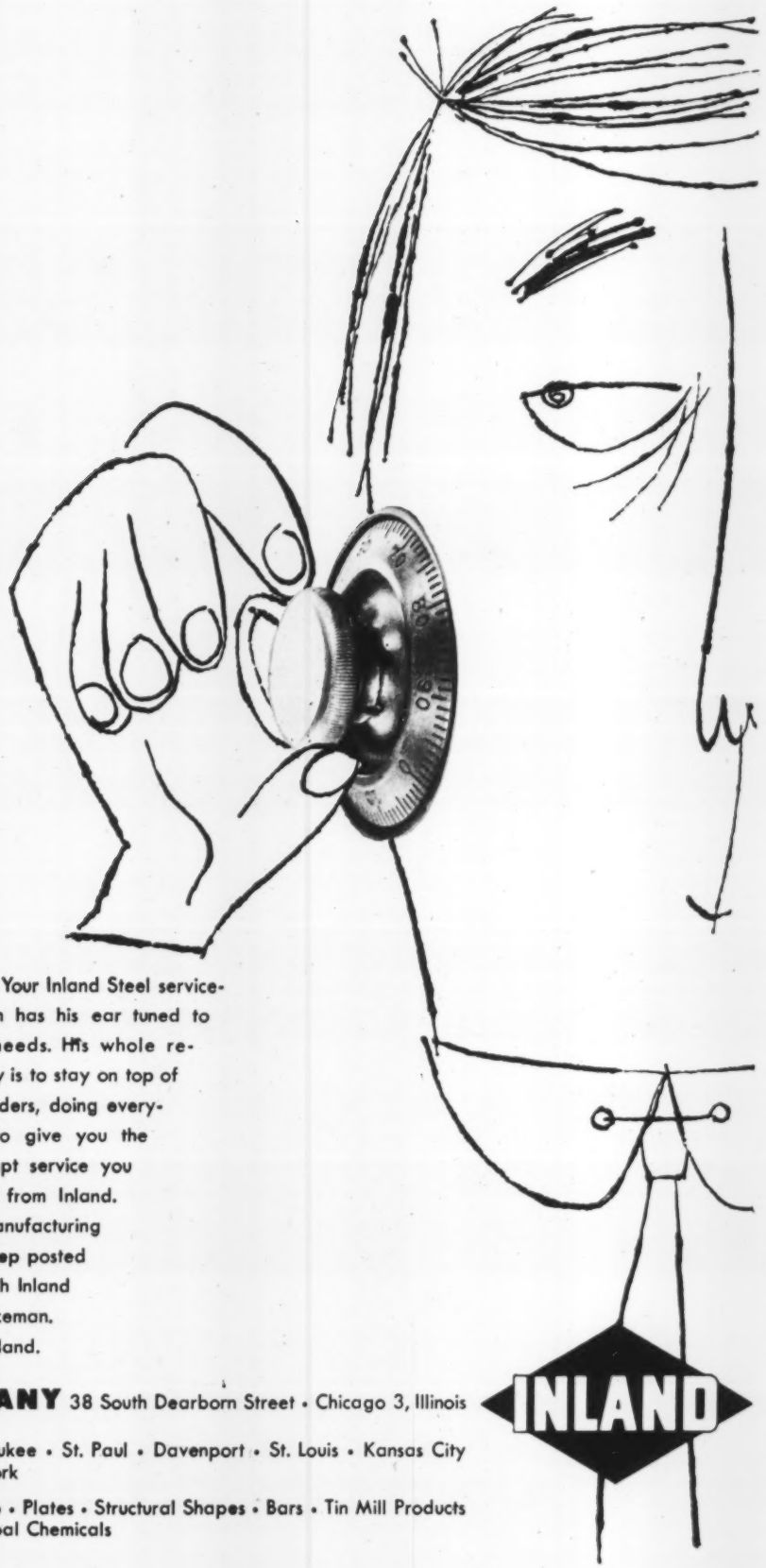

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CIO-AFL Merger: Trouble for Industry?

Special committees of the big unions are hard at work formulating an alliance. Immediate consequences may be small, but many observers fear labor domination of politics may result

CIO-AFL MERGER—is it coming? And if it does, what will it mean to industry and government?

STEEL checked with industrial relations executives, arbitrators and others in touch with the subject. We asked them what they thought *MIGHT* happen *IF* there were a merger.

Here's a composite of what they think.

Leader Cautious—The two big unions are closer to consolidation than they have been for years. If they can't get together now, the leaders know it will be a long time before they get another chance. So they're proceeding with caution—trying to keep happy as many officials and members as possible. Fine points of policy will be tabled until after an initial get-together is arranged.

For that reason, if the merger comes about, little immediate change will be noticed in labor relations at the local level. The first alliance will be aimed at presenting a united political front, nationally and locally. An all-out drive is in order to elect a Democratic president in 1956—and a "friendly" Congress to go with him, of course.

No Big Changes—No big push for drastically increased wages and fringe benefits is likely for several years. A "get tough" policy is also out until political objectives and internal unity are achieved—probably around 1957 if the merger goes through.

That doesn't mean your job at the bargaining table will be any easier until then, though. Wage boosts of 2 to 4 cents an hour are docketed for 1955 (with the asking price perhaps as high as 15 cents). Further extensions of pensions and insurance are also on the list. But most of those will be asked for with or without merger.

GAW on List—Guaranteed annual wage will be pushed—again, with or without a merger. The consensus is that chances for a union victory on GAW would be improved if merger comes.

How about the federal government stepping in to prevent the merger? It's unlikely because it would bring cries of antilabor ringing through the nation. Any subsequent attempt to bring the unions under antitrust laws is also doomed for the same reason. Any legislator who tried it would be in trouble.

Checks—That doesn't mean labor will have a free rein to push everybody around, including the government. Any such move would probably break up the union from within. Some union leaders still believe that unions should steer clear of politics. The move also might push conservative Democrats closer toward Republican thinking on labor, which would stall any big revisions of Taft-Hartley.

And T-H revisions are high on the list of labor's objectives. Other things that will be actively sought

George Meany, left, chief of the AFL, and Walter Reuther, head of the CIO, will have additional reasons for friendly get-togethers if their unions can work out merger plans

NEA

are lower taxes for lower income groups, full employment, bigger old age pensions and survivors insurance, higher unemployment benefits, higher minimum wage—things labor is asking for now but is not quite strong enough to get.

Compromise—Governing a unified union would be the heads of the present ones. If any of the large independents would come in, their leaders would also be represented, but it's not likely they'll join the merger until they get a look at its workings. One thing is fairly certain: No one man is strong enough to set policy for the merged unions. Compromises will determine the early course to be followed.

But it's not the short-term outlook that worries most people contacted by STEEL. Many see a Labor party and a big step toward socialism in the making. A dictatorship by labor is the gloomiest prediction. A more optimistic view is that merger would reduce jurisdictional fights and bring more labor statesmanship.

Voting Bloc—The merged unions would certainly be a potent political force, controlling as many as 30 million votes, according to some estimates. Before the last elections it was estimated that less than 50 million votes would be cast. Had the union vote been organized into a unified force, it could have dominated the contest.

But that's all assuming that the merger is coming. It may not. None of the toes of present leaders can be stepped on too hard or the screams may drown out negotiation talks. Some bosses will keep their unions out of merger plans because they believe their membership won't derive any benefits from it. Others will stay out because they won't want their autonomy infringed on. If one or two big unions decided to stay out, it could wreck the plans.

Steady Employment: Benefits for All

Management's stake in steady jobs for its workers adds up to more profitable operations. The U. S. Chamber of Commerce suggests this systematic, continuing program

STEADY EMPLOYMENT — the goal of guaranteed annual wage proponents—should be a prime objective of management, too.

It would mean less labor turnover, less training outlay, better utilization of equipment, lower unemployment compensation costs.

Some Obstacles — The U. S. Chamber of Commerce in its new pamphlet, "Steadier Jobs," admits some irregular employment and production is inevitable—products undergoing model changes, seasonal sales, etc. But there's a long list of profitable steps a company can take which will help regularize employment.

To tackle the problem in your plant, the C of C suggests these steps:

1. Appoint a "steadier jobs" committee composed of top executives from sales, personnel and production to head up the program. 2. Analyze your firm's layoff experience and the costs involved; study them in terms of sales and production patterns. 3. Set up regular committee meetings to report on findings and appraise suggestions. 4. Make sure the committee's recommendations are channeled to key persons who will carry them out effectively.

Guideposts—Key to the problem, says the C of C, is systematic, continuing attention from top management. Below are checklists in three areas which will help guide you in a program for steadier employment.

Marketing and Sales

1. Create out-of-season uses for seasonal products.
2. Diversify your market geographically or otherwise to avoid seasonal fluctuations.
3. Exert more sales effort during dull seasons.
4. Give your product an all-season appeal.
5. Use a discount system to encourage early order placement.
6. Check feasibility of postdating shipments.
7. Intensify market research to probe causes of irregular buying.
8. Bring out new models or packaging during slack seasons.

Production Policies

1. Produce parts, subassemblies or finished products for stock during slack periods.
2. Simplify the product-mix or line with a view to facilitating production for stock.
3. Diversify product-mix, developing slack-period lines.
4. Conduct maintenance, repair and construction work during slack periods.
5. Spread out orders at the peak.
6. Meet peak demands by special production-incentive systems.
7. Contract work out to avoid peaks.
8. Intensify production planning and budgeting for 12 months.

Personnel Policies

1. Recruit personnel with more versatility and flexibility to permit shifting slack to busy departments.
2. Train employees for more than one task.
3. Utilize slack periods for training and retraining workers.
4. Schedule vacations during slack periods.
5. Develop "flying squadron" or utility crews to meet temporary department peaks.
6. Hire part-time people, especially students and those not wanting full-time jobs, for peak periods.
7. Develop arrangements with one or more other employers to borrow or lend employees.

More new products and more hard selling displayed in Chicago as the . . .

Metal Show Points to Good Business in '55

MORE THAN new products were on display in Chicago last week.

The 36th National Metal Exposition in the International Amphitheatre also showed stronger selling techniques. The 444 exhibitors were prepared to offer copious information, equipment in actual operation and even free plant trials to entice the potential customers.

Unveilings—The more than 50,000 visitors saw a record number of new products introduced. One stamping press, the first of a new model, was completed just four days before the show opened.

What's more, many exhibitors had their new products in operation. Vacuum melting furnaces, a salt bath quenching furnace, welding and cutting devices, machine tools, testing equipment and many others were going full tilt as their own best salesmen.

In one case, if the visitor wasn't sold by watching, he could have a $7200 torch cutting machine sent out to his plant for a 30 day free trial—no strings attached.

How's Business?—Metalworking executives on both sides of exhibit counters said they were feeling increased competition. No one was so optimistic that he didn't face the facts. But STEEL couldn't find a single pessimist among the dozens of executives it talked to. Average guess for '55 business: It'll be good, but it won't be plush.

Technical Trends — The theme of automaticity wound its way through many of the exhibits. In one booth a fully automatic Rockwell tester checked hardness of 2000 parts an hour. Pieces were hopper fed into the unit and automatically placed in position beneath the diamond penetrator. Tiny photoelectric transistors picked up the hardness readings and translated them into relay-activating impulses that classified parts as hard, soft or acceptable.

A 4-ft diameter rotary spray machine that paints flatware on a laydown conveyor was on exhibit. The gun automatically turns on when it meets the edge of the ware, turns off on leaving it.

Practical — Also, old stand-bys were reintroduced on the basis of their practicality for smaller shops. Small resistance welding machines, machine control devices, short run die materials and an easier-to-use cold cleaner were all aiming at the small shop.

Materials — Titanium held the spot light. One booth displayed more than $200,000 worth. Included was a 4000-lb coil of titanium sheet that was rolled 50 in. wide on a hot mill at 1200 feet per minute.

Visitors saw magnesium in new forms—coils of wide strip and extrusions. A new die steel contains 12 per cent vanadium, 1 chromium, 3.25 carbon and 1 molybdenum. Especially good for forming stainless steel, outstanding properties are abrasion resistance and antigalling.

There was plenty of evidence that metallurgists are working harder than ever to raise the heat barrier on materials. On exhibit for the first time was an impeller that had operated for 100 hours at 1900° F and was still as good as new.

Metalworking's Earnings Will Hold Up

	Nine-month profits 1954	1953
Affiliated Gas Equipment Inc.	$1,239,805	$1,231,425
Air Reduction Co. Inc.	4,789,652	5,616,519
Aluminum Co. of America	30,761,101	40,141,929
Allis-Chalmers Mfg. Co.	19,323,469	15,150,429
American Machine & Foundry	2,832,000	3,324,000
American Steel Foundries	3,626,688*	6,337,892*
Baldwin-Lima-Hamilton Corp.	2,656,172	5,519,786
Bower Roller Bearing Co.	1,856,564	2,117,901
Bohn Aluminum & Brass Corp.	4,572 (L)	1,316,149
Blaw-Knox Co.	3,141,142	3,056,927
E. W. Bliss Co.	2,447,667	1,962,052
Briggs & Stratton Corp.	3,680,316	4,599,592
Crane Co.	3,917,000	6,776,000
Eaton Mfg. Co.	6,315,421	7,771,013
Electric Auto-Lite Co.	120,796	8,242,756
Firth Sterling Inc.	186,300	392,200
Foote Mineral Co.	912,175	178,222
General Steel Castings Corp.	1,401,141	2,539,559
Garrett Corp.	840,500**	768,261**
General Refractories Co.	1,440,652	3,150,142
Harbison-Walker Refractories Co.	2,518,116	4,972,804
Hamilton Watch Co.	1,071,028	1,113,513
Jack & Heintz Inc.	1,114,900	1,026,300
Kennecott Copper Corp.	57,973,802	65,545,066
Lamson & Sessions Co.	959,059	1,157,502
Marion Power Shovel Co.	520,792	972,651
National Cash Register Co.	8,158,527	8,142,921
National Malleable & Steel Castings Co.	5,138 (L)	1,602,911
Parker Appliance Co.	268,490	281,009†
Pullman Inc.	11,245,832	8,456,273
Revere Copper & Brass Inc.	7,540,648	7,910,664
Reynolds Metals Co.	14,804,324	15,704,253
Scovill Mfg. Co.	2,504,259	3,254,564
Signode Steel Strapping Co.	1,589,000	1,457,000
Square D Co.	3,134,428	3,228,578
Stewart-Warner Corp.	1,831,719	3,187,186
Thew Shovel Co.	241,000	1,342,000
Twin Coach Co.	1,273,306	420,600
U. S. Pipe & Foundry Co.	6,410,931	5,085,763
Westinghouse Electric Corp.	62,644,000	53,219,000
Yale & Towne Mfg. Co.	1,018,478	2,033,762

* Fiscal year ending Sept. 30.
** Quarter ending Sept. 30.
† First quarter of fiscal year beginning July 1.
(L) Loss.

PROFITWISE, the worst quarter of 1954 is over. But the year as a whole will stack up pretty well by any peacetime yardstick.

That's the tenor of most third-quarter earnings reports going to metalworking stockholders. Two out of three companies (see the table) show nine-month profits for the year are down from 1953; most are optimistic, however, that the uptrend in the current quarter will narrow the profits gap between this year and last.

Sales vs. Earnings — Sales for the first three quarters of this year are definitely down—as much as 35 per cent for a few companies and an average of about 10 to 15 per cent over-all. But the percentage decline of profit is not so steep.

Elimination of the excess profits tax has given manufacturers relief, and management has been "tightening up" generally all year. High-cost overtime operations have been eliminated and manufacturing, purchasing and selling costs have been checked and cut where possible.

Ups and Downs — Most noted sales drop by the metalworkers this year has been in defense orders. Some suppliers for the railroad and auto industries suffered sharp declines, too. On the other extreme, there were companies like Westinghouse, National Cash Register and Foote Mineral whose civilian sales topped those of 1953.

Another note of normalcy: Backlogs are regaining realistic patterns. They're down from last year, but as one metalworker put it: "There's less water in the backlog now. Purchasers no longer have to place the same order with two or more companies as delivery insurance."

Still Good—The profit outlook adds up to this: The third quarter was the lowest this year. But the trend in the current quarter is up and the year over-all will end up second highest in history.

Heavy Construction Predictions

The construction outlook for 1955 gets two more votes of confidence (see STEEL, Nov. 1, p. 39) from leading construction companies.

Says Turner Construction Co., New York: "During this year there has been an increasing volume of work released without indication of decline. Public and commercial work in 1955 should be active due to the large backlog."

F. H. McGraw & Co., Hartford, Conn., notes: "Many of our clients have indicated that they will have to expand or revamp current plants to keep abreast of technological developments and the demand for new products and materials . . . new industries and diversification in present plants will tend to keep industrial construction up."

Conveyors: Sales Decline Levels Out

Dollar sales of conveyor equipment are leveling out now after heading down for the first half of 1954. Short-term outlook: Hard selling. Long-term outlook: Sky's the limit

CONVEYOR manufacturers look forward to good business over the long pull.

Sales this year are expected to be down about 8 per cent from what they were in 1953 (see the chart)—still good business compared with almost any previous year. They are projected at about current rates well into next year, with 1955 winding up perhaps 5 per cent ahead of 1954.

Whiz Bang—That could be too conservative, however. "I feel that we (the conveyor equipment manufacturing industry) are right on the brink of a terrific technological expansion that could throw any and all estimates into a cocked hat—that we shall see more development in the next ten years than in the past 50 . . ." says R. C. Sollenberger, executive vice president, Conveyor Equipment Manufacturers Association.

Supporting the optimistic long-range outlook is the continuation of modernization trends in industry—older plants must be conveyorized to help bring their costs down to a par with newer installations; redesign and automation also mean greater use of conveyors; new industries are becoming conveyor customers, such as the atomic energy industry, where conveyors feed in bulk materials for uranium concentration, carry out radioactive materials from reactors. New leisure time industries also are becoming conveyor customers, such as the bowling industry with its automatic pin setter.

Plus Two — Besides those markets, conveyors can be expected to expand in two other fields: Transportation of bulk materials (of which the Riverlake project in Ohio is the most dramatic example) and the transportation of people (the conveyor that replaces the subway shuttle trains between Times Square and Grand Central in New York city is a prime example).

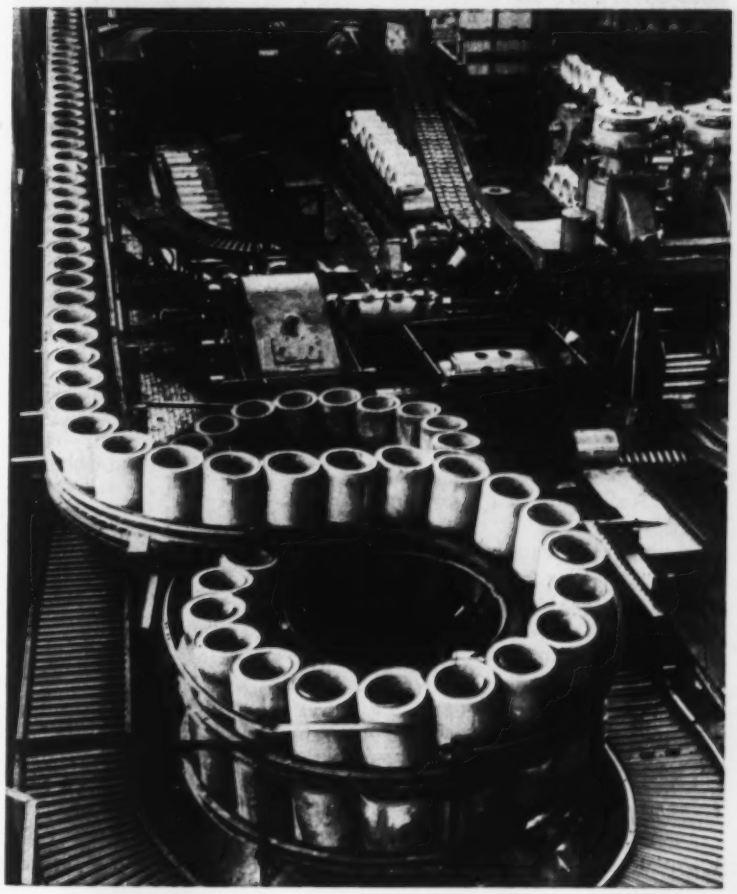
Conveyor manufacturers are continuing to redesign their products to reduce maintenance and to promote greater safety in use no matter what type person is operating the equipment. New materials—such as aluminum, magnesium and plastics—are being tried out in certain applications, but the backbone of conveyor construction remains iron and steel.

DOLLAR SALES OF CONVEYOR EQUIPMENT*

(in millions of dollars)

1952	1953	1954	1955
$268	$304	$280	$294

*Estimated by STEEL.



Revere Copper & Brass Inc.

Inland Steel Co.

Once a waste product and big headache, slag today is big business with a bigger future

Construction Boom Spells Good Times for Slag

About 95 per cent of present 30.5 million ton annual output goes into construction. Considering mammoth new building plans, there are good grounds for industry leaders' long-term optimism

BOOMING CONSTRUCTION is the open sesame for the slag industry. Building was responsible for a record-breaking 30.5 million ton volume in 1953, worth more than $40 million. This year will be at least as good.

Practically all slag produced goes into one type of construction or another. Bureau of Mines analyses show long lists of uses, including aggregate for portland cement, highways and airports, railroad ballast and road fill. The material also plays a part in bituminous work and the making of hydraulic cement and lightweight concrete. Minor applications include oyster-bed fill, paint filler and agricultural liming, but they account for only about 5 per cent of total tonnage.

Spotty—Despite universal optimism about the future, this year hasn't been wholly good in all areas. Supply is the problem. Roughly half a ton of slag is produced for each ton of pig iron. The prosperity of slag processors is directly tied to steelmaking activity.

In Cleveland, at least one processor has had difficulty meeting demand. A. W. Wood, general manager of Cleveland Slag Co., says that during the first three quarters of the year he had to ration his outlets because of low-level blast furnace operations.

Supplies have also been tight in the Buffalo area. H. N. Snyder, vice president of Buffalo Slag Co., reports his company has had to obtain slag from several furnace locations to meet demand.

Steel and Slag—Since slag is directly competitive with natural rock and other materials, most construction contracts are won on a price basis; freight and handling costs must be kept to a bare minimum. Slag is transported by truck and rail for the most part, with about 2 per cent of total tonnage going by waterway. Average distance between plant and site of use is about 40 miles. Areas of concentrated use are found within striking distance of steelmaking centers. Ohio, Pennsylvania, Alabama and Illinois rank high as users in the East, Texas and Colorado in the West.

Typical of the way in which slagmen have built their industry from nothing to present volume is the promotion of granulated and expanded slag for use in lightweight construction.

One of Five—The first expanded slag concrete block was manufactured in 1928; more than six other types have since been introduced. Last year, one out of every five lightweight masonry blocks made in the U. S. was produced

from slag, representing a dollar volume of more than $5.5 million. Development of granulated slag for use as a constituent for portland cement is another example of the successful application of research to slag utilization.

It's forecast that steel output will be up 7 per cent next year to 75 per cent of capacity. The increased supply of raw materials should mean that 1955 will be yet another record-breaking year for the slag industry.

Inland Announces Expansion

Galvanized steel sheet capacity by the end of 1955 will be boosted 60 per cent at Inland Steel Co., President Joseph L. Block announces.

Construction will be started next month on a new continuous galvanizing line at Inland's Indiana Harbor Works. The company's first continuous galvanizing line was installed in 1951, its second last May. Capacity of the three will be about 210,000 tons annually when the program is completed.

This is the second major expansion started by Inland this year. In June it began construction on a wide flange beam mill.

Atomic Power Plants: Still Too Costly

But economically competitive nuclear power reactors are getting closer. Here's a recent evaluation of the commercial reactor program and a couple ideas of what's needed to help it along

THE PRESENT COST of atomic power is about three times too high to be economically competitive.

That is the nub of a report by W. Kenneth Davis, deputy director, Division of Reactor Development, Atomic Energy Commission. It was read at a National Industrial Conference Board round table on "The Current Outlook for Atomic Power Costs."

Not Close Nor Easy—"I have every confidence," said Mr. Davis, "that scientists and engineers will solve the problems involved in the economic use of nuclear power. However, it clearly is neither a short-range nor an easy accomplishment."

Mr. Davis estimates the present cost of constructing a nuclear steam power plant is two to six times as high as it should be to be competitive with construction costs of a similar conventional power plant. The useful life of an atomic power plant must be increased by 50 to 100 per cent to get an acceptable amortization basis.

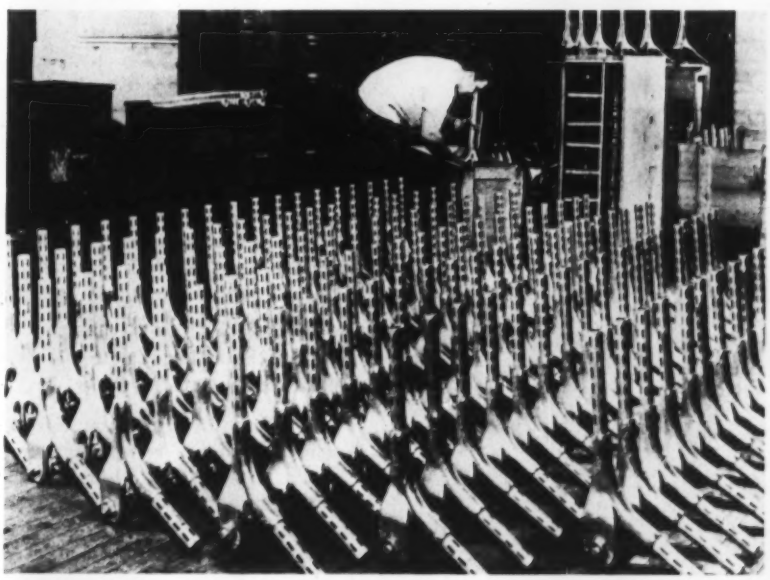
All Along the Line—Cost reductions must be made for substantially all the items in power plant construction and operation—"not just for some or even for most of the items," cautions Mr. Davis. "Because the margin (of saving) is so small, it will be difficult for exceptional achievement in one area to compensate for shortcomings in others. This necessity for a high degree of success in almost every one of a variety of technological fields is a fact that must be faced in evaluating the prospects for economic nuclear power."

All that shouldn't be taken as conclusive arguments that nuclear power reactors will never be economically feasible. Mr. Davis points out that the cost of fuel for a nuclear power reactor, while by no means negligible, is not even now a bar to economic nuclear power. And some of the highest cost items, such as fuel element fabrication costs, are susceptible to considerable cost reduction by technological improvements and mass production.

The neutron was first observed just 22 years ago and the neutron chain reaction first demonstrated only 12 years ago. New discoveries and inventions are undoubtedly ahead.

Needed: A Customer—In the meantime, we need a customer who can afford to pay for nuclear power despite its present cost, says Mr. Davis. Military reactors and production are not the answer to developing necessary power reactor technology. Perhaps some area in the world can be found where power is needed so badly that nuclear power can be justified.

"We also need an engineering approach to our problems . . . we need engineers who will say, 'I don't know just how we are going to build this reactor but we *will* build it and it *will* work.' Otherwise, we are in danger of 'researching' our reactor program to death," says Mr. Davis.



Connectors Await Shipment for Mid-Air Installation

Installation of these dead-end compression connectors is based on a concept of installing tools so light they can be used in mid-air. Made by Thomas & Betts Co., Elizabeth, N. J., they will dead-end large aluminum and ACSR cables to transmission towers. Low resistance joints, vital for high voltage lines, are provided by compression connections at both tension and jumper ends

By E. C. KREUTZBERG Washington Editor

Capitol Hill Likes SBA, Too

The Small Business Administration is one of those government agencies that's appreciated by Congress as well as businessmen. Its extension beyond June 30, 1955, appears certain

MANY are the undecided and explosive issues in Washington. But extension of the Small Business Administration beyond its present expiration date (June 30, 1955) is not one of them.

Congressmen, both Republican and Democrat, like the SBA. Perpetuation of that agency—or something like it—is considered a shoo-in on Capitol Hill.

Off the Hook—One reason congressmen like the agency so well is that it's a handy political tool. When a businessman constituent comes to Washington with a request or a complaint, the congressman can turn him over to SBA. There the businessman's story is listened to sympathetically. The businessman may leave with a contract or subcontract or perhaps a business loan.

The only reason Congress set up SBA for two years rather than as a permanent body was explained by Sen. Homer Capehart (Rep., Ind.). He said that a government agency which makes business loans should come up for review every two years.

Business Angle—A poll just completed by George Burger's National Federation of Independent Business indicates many businessmen like the SBA, too. Of more than 100,000 businessmen questioned, 75 per cent voted for continuance of the SBA, while 22 per cent voted for its liquidation. Companies that object generally to the government's being in business do not seem to feel the same antipathy to SBA. That probably is because the SBA only makes direct loans to business when the borrower cannot get the money anywhere else; there really isn't any competition with the banks.

One of the chief questions to be decided next year when SBA comes up for continuance is whether it should be continued as an independent agency or made a part of the Commerce department. And present sentiment in Congress favors retention of the independent status.

Busy, Busy SBA . . .

During its first 12 months as a loan agency, SBA was active. It approved 858 business loans involving $47,323,000. Of those, nearly 70 per cent (588, totalling $33,884,-291) were made in participation with private banks. The other 30 per cent (270, totaling $13,438,435) were made directly by SBA because private banks would not handle them.

SBA is not synonymous with Santa Claus, however. It declined 1441 loan applications because of the applicants' inability to meet SBA's credit standards. Also 508 loan applications were withdrawn from SBA because the applicants were able, with the assistance of SBA regional offices, to obtain private financing.

Appointed to BDSA

Niels A. Olsen has been appointed deputy director of the Metalworking Equipment Division of the Business and Defense Services Administration

The Written Word . . .

Besides its loan-making activities, SBA has tried other ways to help small business prosper. Under Administrator Wendell B. Barnes, the agency has been issuing many reports and booklets designed to help the small businessman become a better manager.

Especially helpful is the 72-page booklet written by Ralph B. Tower, professor of economics and finance, West Virginia University, entitled, "A Handbook of Small Business Finance."

Basically, the booklet is intended to furnish small-firm managers information that will enable them to understand better the financial operation of their business and to prepare statements that make sense to a banker.

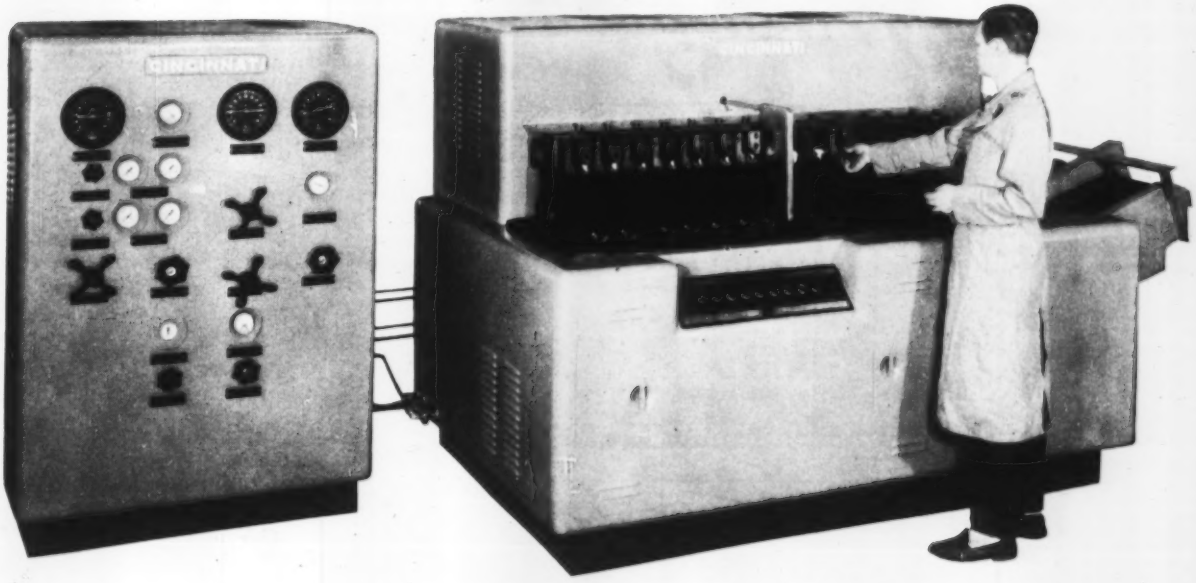
Other helpful SBA literature includes the "U. S. Government Purchasing Directory" (tells which government agencies buy what products and services) and "U. S. Government Specifications Directory" (the first complete guide to reference sources of the specifications and standards used by the government in its purchasing).

Clue to Usefulness . . .

One interesting fact about SBA is that it is not a refuge for government career men. It has a lot of men, many retired from private companies, who have had many years of management and financial experience. That's particularly true in the agency's 14 regional offices. In those offices a small businessman usually is able to find someone who can understand his problems and offer practical advice and assistance.

what's new?

NO. 29 OF A SERIES.



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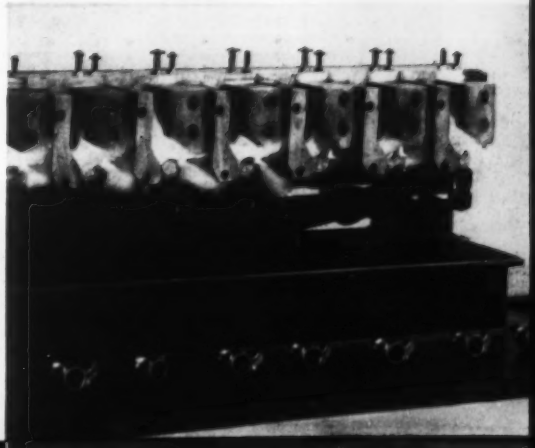

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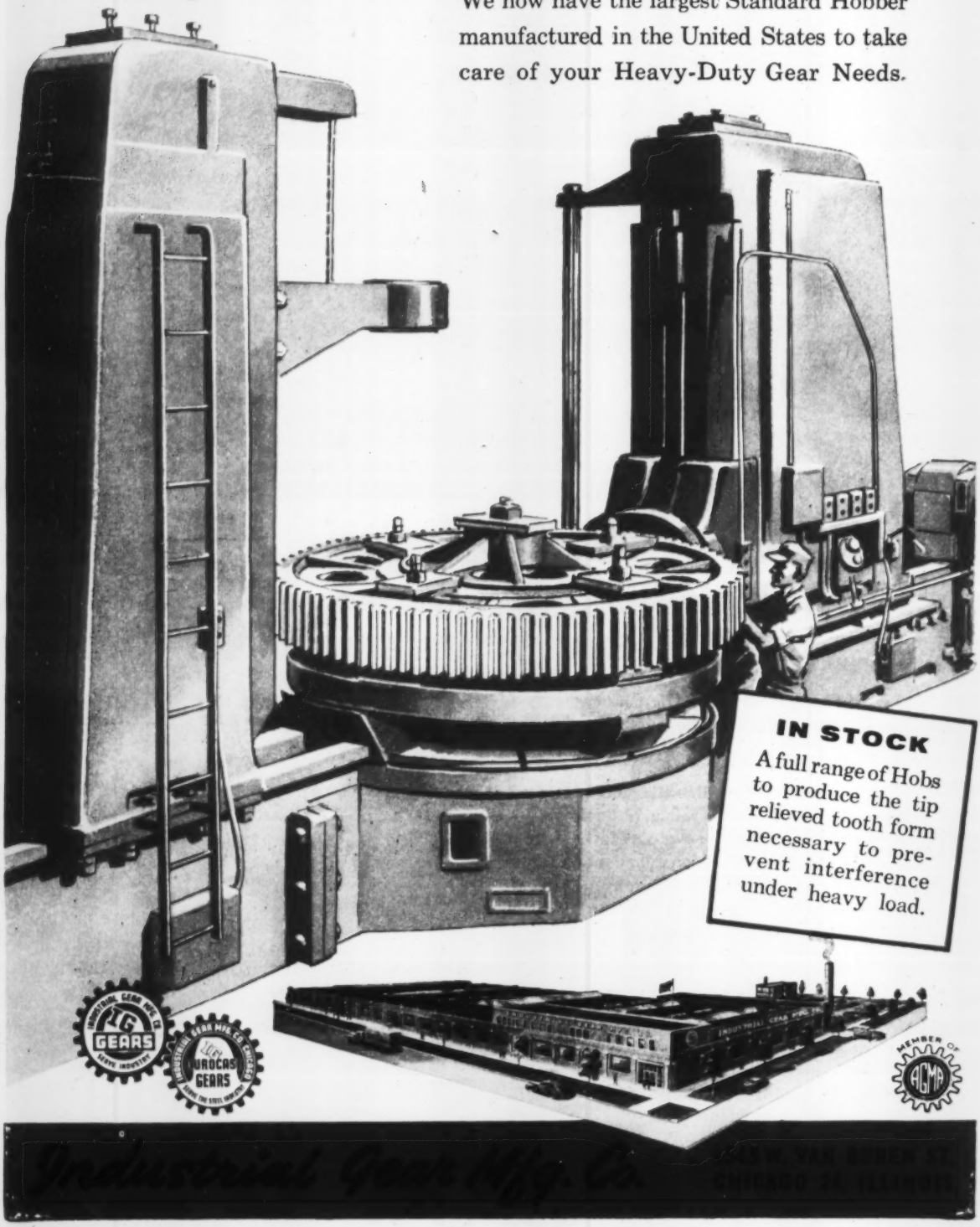

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Pacific Tube's Tillia: Up from the Ranks

SURVEYS tell us only about 10 per cent of hourly production workers want to be bosses.

So, that one in ten is an unusual fellow. What's he like? How did he make out moving over to the management side?

Answer—Carl A. (Dick) Tillia took the step. "It was the most wonderful thing that ever happened to me," reports the man who is now plant superintendent for Pacific Tube Co. at Los Angeles. He directs 235 men who turn out about 20 million feet of tubing a year.

Dick Tillia couldn't go to college because of the depression, so he started his first job on Aug. 11, 1933, at National Tube Co.'s Ellwood City, Pa., plant. He began on a lead pot, lead-coating stainless steel. After a while he helped with research on new lubricants and development work at National Tube's rod-drawing bench. He was particularly interested in practices for setup.

The Shift—Dick Tillia worked ten years at National Tube, but in 1943 he got an offer to go west. Superior Steel Co. was setting up a subsidiary, Pacific Tube. He accepted a job as foreman of the bench department.

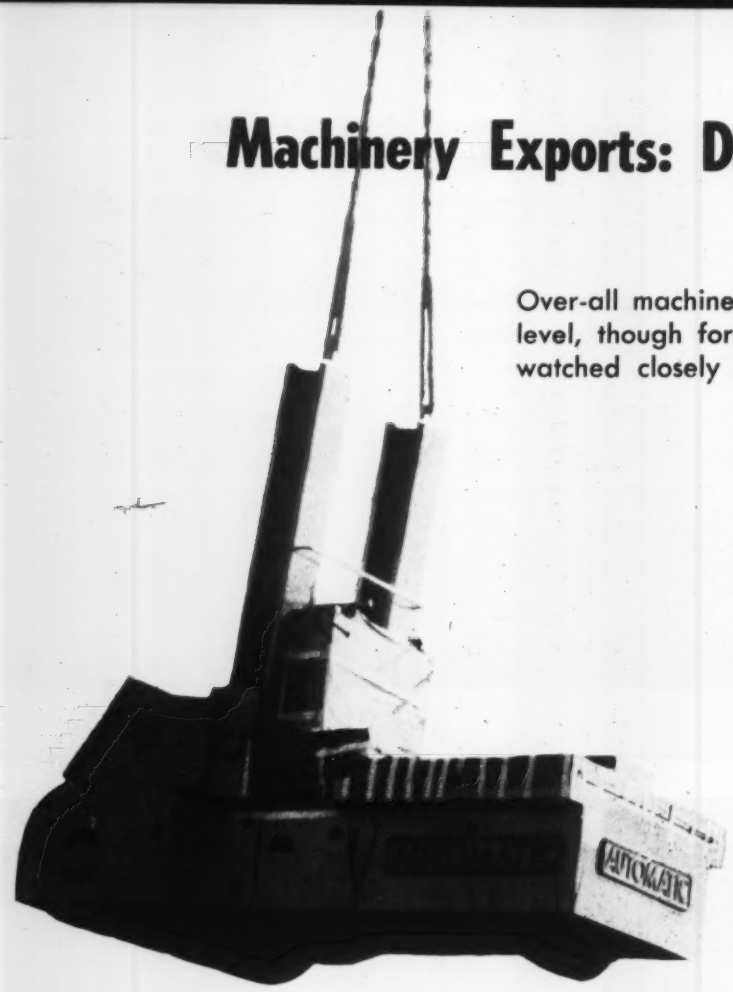
Dick Tillia liked it, and from then on his advance was rapid—general foreman in charge of the second shift, assistant superintendent, then his present job as plant superintendent, which he has held since 1949.

The Plant—He's proud of his shop, particularly of equipment which will draw 340 feet per minute. The average reduction is more than 40 per cent on each draw pass. Because of the hefty freight charges Pacific Tube must pay on tube hollows it brings in from the East, it has to be efficient to remain competitive. Men like the company president, Edgar H. Lloyd, say, "Tillia is a big reason why we are efficient."

As a former United Steelworker member, Dick Tillia feels at home with the day-to-day union problems. "Sure, there are more headaches at this desk than at a draw bench, but there's more excitement, too." He smiles as he adjusts a small sign on his desk that reads, "Ulcer Department."

Machinery Exports: Down but Still Good

Over-all machinery exports are still at a high level, though foreign markets will have to be watched closely in 1955 to keep them there



THIS YEAR'S commercial exports of American-made machinery may run second or third only to those of pace-setting 1953.

Last year machinery exports totaled $2.9 billion; in 1952 they were $2.8 billion. For the first 5 months of 1954 these shipments were running 6.6 per cent behind those of the comparable period in 1953. If that percentage of decline holds for the year as a whole, machinery exports in 1954 will be about $2.7 billion, third best in the history of the industry.

Outlook: Fair—But the decline in machinery exports may be less than 6.6 per cent when the year is over (see table on this page). "Continued industrial expansion in many foreign areas and numerous new economic development projects offer additional opportunities for increased sales in the immediate future," says the Machinery & Allied Products Institute.

Latin America and Canada seem to offer the greatest promise for an expansion in direct sales. Canada is one of the fastest growing export markets for American machinery: Exports of capital goods rose 21 per cent in 1952 to $787 million. In 1953 they rose another 12.8 per cent to $887 million. Exports for the first 5 months of 1954 indicate sales of about $858 million this year.

Some Are Ahead — Manufacturers of certain types of machinery are continuing to capitalize on the growth economy in Canada and will raise their shipments in 1954. U. S. exports of railway equipment, for example, have more than doubled in the opening months of 1954, compared with early 1953. Other industries that have increased shipments to Canada this year include ball and roller bearing equipment, food

U. S. Machinery Exports

(millions of dollars)

Machinery Classification	1951	1952	1953	1954
Electrical machinery and apparatus	$ 533.0	$ 608.4	$ 643.4	$ 574.5
Industrial machinery	1337.3	1568.6	1536.8	1444.5
Engines, turbines and parts	167.0	155.5	150.2	152.0
Construction, excavating and mining equipment	406.3	504.2	485.5	410.5
Machine tools and parts	73.0	131.2	125.2	81.0
Other metalworking equipment	119.4	131.9	152.7	137.0
Textile, sewing and shoe machinery	144.1	107.4	95.5	107.0
Other industrial machinery	427.5	527.3	527.8	557.0
Agricultural machinery excluding tractors	140.8	140.8	138.4	141.0
Tractors, parts and accessories	310.2	289.4	300.1	260.5
Printing machinery	35.8	28.4	29.8	37.0
Office machines and parts	119.5	89.1	87.3	93.5
Railroad and transit equipment	n. a.	81.1	106.8	175.0
Scientific and professional equipment	63.9	55.8	57.5	63.0
Total Machinery Exports	$2540.5	$2861.6	$2900.1	$2789.0

NOTE: Since June, 1950, certain classifications of exports have been designated "special categories" for security reasons. All "special category" items have been excluded from data.

Source: Machinery & Allied Products Institute. Estimates for 1954 by STEEL.

processing machinery and woodworking machinery.

As in Canada, a tremendous amount of industrial growth has been going on in Latin America during the last several years. "Exports of U. S. capital goods have, in the main, kept pace with this surge of industrial activity," says MAPI. On their way up: Agricultural machinery, tractors, railroad equipment. On their way down: Electrical machinery, construction, excavating and mining equipment and certain types of metalworking machinery.

European Dip—Commercial machinery exports to Europe were tops in 1952 at $564 million; volume was off to $553 million in 1953 and shows further declines in early 1954. Industrial recovery in Europe, plus dollar exchange troubles, have teamed up to cut U. S. sales there. However, Europe still offers a good market for some types of American equipment: MAPI estimates 35 to 40 per cent of all machinery purchases from the U. S. by European buyers are of machine and metalworking tools; textile, sewing and shoe machinery; and office machines.

Growing Potential — Increased exploration for mineral deposits and a wave of new irrigation systems enhance the prospects for suitable types of capital equipment exports to Africa and Oceania. Electrical machinery, tractors, construction, excavating and mining equipment and some industrial machinery made up 74 per cent of 1953's total $237-million exports to these areas. That percentage relationship will likely be maintained in 1954, comments MAPI, though dollar volume will be down from 1953.

Viewing machinery exports from a product standpoint, equipment in the "industrial machinery" category shows the largest drop in early 1954: Machine tools, other metalworking equipment and construction, excavating and mining equipment dollar sales were off 42 per cent, 23 per cent and 18 per cent, respectively.

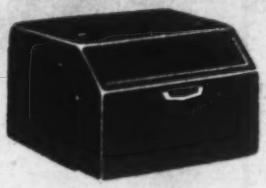
Better Off—Healthy increases in exports for the first 5 months of 1954 were registered by railroad equipment, printing machinery, textile, sewing and shoe machinery and scientific equipment.

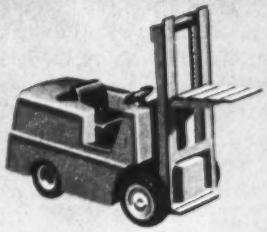
U.S. Machinery Exports by Area of Destination

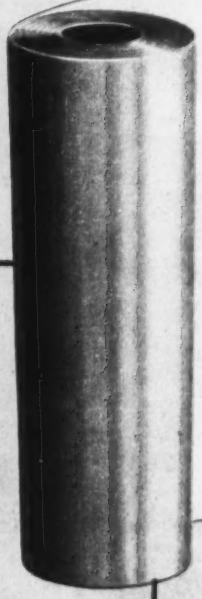
1951-1953 (millions of dollars)

Machinery Classification		Canada	Southern No. Amer.	So. Amer.	Europe	Asia	Oceania	Africa	Latin Amer.	OEEC Countries
Electrical machinery and apparatus	1951	120.5	88.9	154.2	82.1	61.4	6.8	19.1	236.8	74.1
	52	164.8	103.1	134.4	92.2	78.5	13.5	21.9	229.8	87.9
	53	219.2	92.6	133.6	92.8	78.3	7.2	19.6	215.2	83.0
Industrial machinery	51	316.9	181.1	295.9	315.6	122.9	36.5	68.4	460.5	303.2
	52	389.6	178.8	315.0	372.0	180.3	45.5	87.5	470.8	348.1
	53	406.9	155.3	282.9	358.5	213.2	30.6	89.5	420.4	332.8
Engines, turbines and parts	51	44.8	27.7	30.0	31.3	20.2	4.9	8.3	55.2	29.0
	52	40.4	20.9	31.3	20.7	27.3	5.9	9.0	49.8	18.2
	53	43.1	17.1	31.0	24.6	21.4	2.5	10.4	46.1	21.2
Construction, excavating and mining equipment	51	105.3	50.3	104.8	58.7	40.0	13.7	34.1	148.0	53.2
	52	127.5	51.6	121.2	79.6	61.6	17.7	45.0	162.2	69.2
	53	117.8	42.3	111.9	85.0	74.8	8.9	44.2	148.6	73.3
Machine tools and parts	51	15.9	2.5	4.9	45.0	2.7	1.3	.7	7.2	44.7
	52	25.1	2.8	4.3	91.5	4.4	2.3	.7	6.9	90.6
	53	27.7	4.6	4.8	78.4	6.9	1.7	1.1	9.2	77.2
Other metalworking machinery	51	22.0	6.3	11.4	65.8	6.7	4.2	3.0	17.5	65.8
	52	28.6	8.6	10.7	63.9	10.4	5.5	4.3	18.8	63.3
	53	40.1	6.7	14.5	63.0	21.1	2.6	4.7	20.9	62.2
Textile, sewing and shoe machinery	51	22.4	13.4	45.5	45.0	10.0	4.1	3.8	58.2	44.4
	52	20.9	10.3	26.5	35.1	9.9	1.9	2.9	36.5	34.0
	53	19.4	8.6	14.2	33.8	13.3	2.8	3.3	22.7	32.8
Other industrial machinery	51	106.5	80.9	99.4	66.7	47.1	8.4	18.6	174.1	66.0
	52	136.0	84.7	121.0	81.1	23.9	12.2	25.6	196.5	72.9
	53	158.7	75.9	106.5	73.6	75.7	12.1	25.3	172.9	66.2
Agricultural machinery excluding tractors	51	58.1	17.0	33.0	6.3	8.4	6.5	11.5	49.5	7.8
	52	75.5	13.8	22.7	9.7	4.5	4.6	9.9	35.9	8.9
	53	77.9	11.8	18.2	8.9	5.1	5.6	11.0	29.3	7.9
Tractors, parts and accessories	51	104.5	38.1	60.9	24.8	23.4	28.5	29.9	96.7	26.1
	52	105.6	28.8	51.9	33.7	19.4	20.2	29.9	77.3	29.9
	53	110.0	26.5	46.2	34.6	25.4	24.5	32.7	69.9	30.1
Printing and bookbinding machinery	51	10.6	3.7	7.0	9.4	2.9	1.2	1.0	10.5	9.2
	52	7.3	3.1	8.3	6.0	2.3	.6	.7	11.3	5.8
	53	9.0	3.4	6.8	6.9	2.3	.6	.7	10.0	6.7
Office machines and parts	51	20.3	11.9	27.9	41.0	11.3	2.4	4.7	39.2	40.5
	52	15.2	10.1	16.4	31.3	10.5	1.7	3.9	25.9	30.2
	53	19.2	9.1	11.0	31.8	9.7	2.4	4.1	19.4	30.8
Railway transportation equipment[1]	51									
	52	13.5	22.2	19.2	8.0	7.0	6.3	4.9	40.1	7.0
	53	26.9	15.3	41.0	7.3	10.5	1.0	4.6	55.9	6.5
Scientific and professional instruments, apparatus and supplies	51	17.5	7.8	15.8	10.3	9.2	.7	2.5	22.9	10.7
	52	15.5	7.1	9.8	11.3	9.8	.5	1.8	16.4	10.7
	53	18.2	6.6	9.0	12.5	8.7	.5	2.0	15.1	11.0
Total U. S. Exports	51	648.4	348.6	594.7	489.7	239.4	82.6	137.2	916.1	471.5
	52	786.9	367.0	577.7	564.1	312.3	93.1	160.5	929.0	528.6
	53	887.4	320.7	548.6	553.4	353.4	72.5	164.3	835.2	508.9

NOTE: All "special category" exports have been excluded.
1951 Data have been adjusted to conform with Schedule B changes effective January 1, 1952.
1/ Separate data not available for 1951. Prior to 1952 included with Vehicles.
Sources: U.S. Department of Commerce, Office of International Trade and Bureau of the Census.







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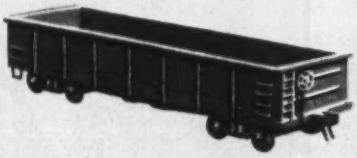

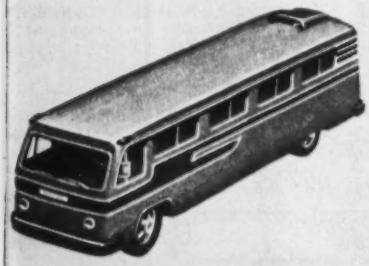

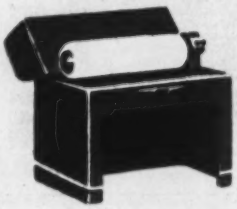

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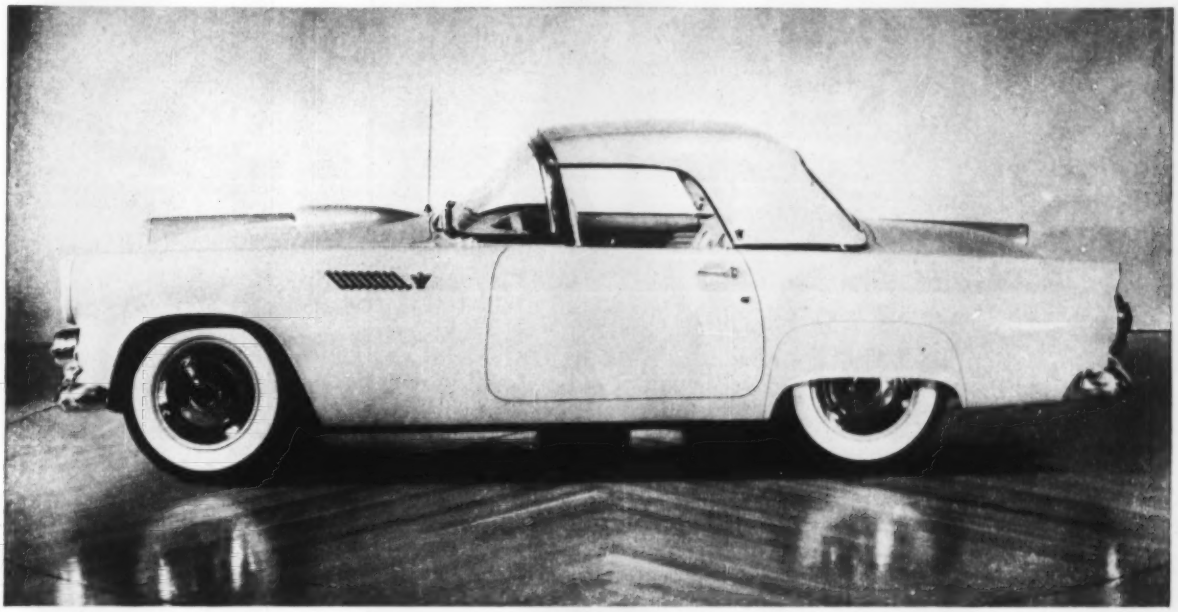

An American-produced sports car for $2695

Ford Thunderbird: 1955 Competitive Weapon

DETROIT

TIMED with more than casual coincidence to arrive on the scene just ahead of Chevrolet's new model thunder, the Ford Thunderbird is drawing many to the dealership across the street.

Priced at $2695 f.o.b. Detroit, this machine costs no more than half a dozen motor scooters. And with a glass fiber hardtop, four-way power seat and roll up windows as standard equipment, many older kids will find the Thunderbird less than a major undertaking to explain to their wives.

Driving Fun — It looks like it could be driven to the grocery in the rain as well as to the club in the sunshine, for the Thunderbird dwells in a charmed sphere that imparts youth without immaturity and fun without hilarity. Optional equipment, such as Fordomatic, power steering, power brakes and power window lifts can convince the little woman that this is very effortless fun, indeed.

That, essentially, is the thing that makes Ford's new "personal car" interesting. A deliberate attempt to broaden appeal over and above the sports car is evident and the result is a livable bomb, as indicated by a recent test drive of the car at the Ford proving grounds. Acceleration with the 198-hp engine is spectacular, clipping off 0-60 mph in about 11 seconds, and the driver is encouraged in such pursuits by a sweep-second electric clock on the dash.

Similar—The time was virtually the same with both cars tested, one with Fordomatic and the other with a three-speed box, though inability to spin the wheels in speed shifting suggested clutch slippage in the latter car. Throwing the Thunderbird into a corner occasions some rolling, some snowplowing and a sensation that the rear end is winding up to break loose with a bang.

Ride is excellent, the seating position is comfortable, the adjustable steering wheel a pleasant touch. It slides in or out three inches and is locked in position by a sleeve and chuck sort of arrangement. Visibility is good, and both front fenders are well in view. Top speed, incidentally, which could not be checked, is reported at "well over 100 mph."

Corvette—Kaput?

As the Thunderbird was making its bow, a price cut on the Chevrolet Corvette to $2575 is reported, keeping the car competitive with the Ford offering.

Corvettes for 1955 were not announced with the other Chevrolet models, but rumor has it they will make their debut about the time the Ford new models hit the showrooms to reverse the procedure of two weeks ago. The cars will be changed in an identification move toward other Chevvie products. A removable hard top is reported to be optional equipment.

Although the Corvette has been a useful publicity gimmick, the project is apparently at an end. As this is written there is no

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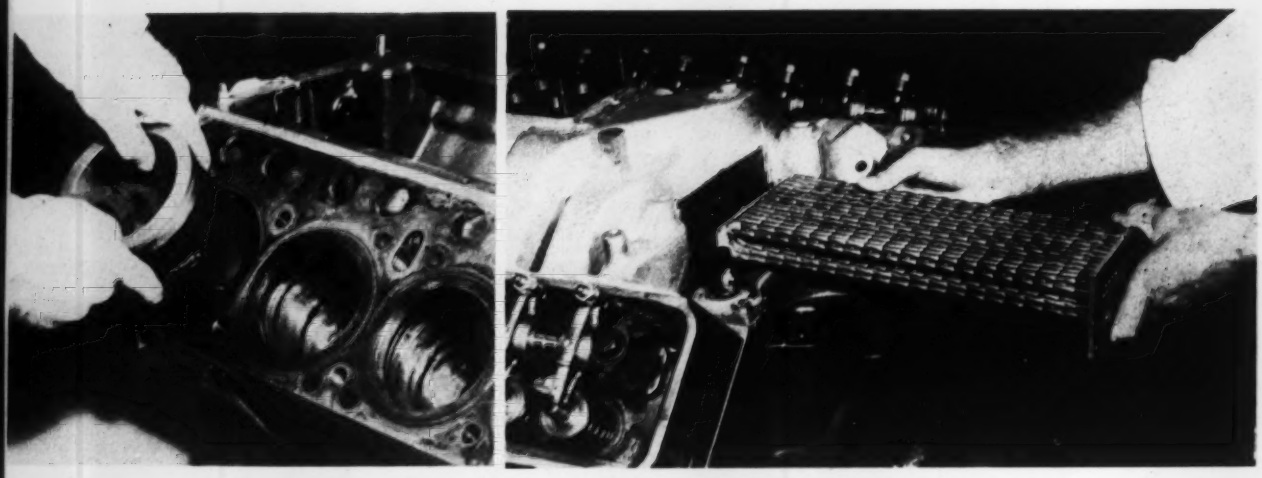

Reo Introduces New V-8 Engines for Truck Tractors

Among distinctive features of the new V-8 engines introduced by Reo Motors Inc. are wet sleeve liners, above left, and a built-in oil cooler in the intake manifold. Larger of the two engines has a 441 cu in. displacement and develops 220 hp at a governed speed of 3200 rpm, or one-half horsepower per cubic inch displacement. Weighing 1211 lb, with accessories and flyheel housing, and measuring 39½ in. long, they will be installed in new truck tractors only 8 ft from the front of the bumper to back of cab

Corvette in the works for 1956, the maverick is being killed by lagging sales which cripple production.

The question now: Is the Thunderbird practical enough to avoid the same fate? Present production with Kirksite dies is rumoredly targeted for 25,000 per annum, about double the Corvette plans.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,249	684,843
June	623,732	713,778
July	543,534	756,592
August	523,799	640,186
September	364,433†	605,228
October	309,200*	651,153
November		457,852
December		529,588
Total		7,815,877

Week Ended	1954	1953
Oct. 2	84,110	142,824
Oct. 9	81,610	148,779
Oct. 16	59,511	152,743
Oct. 23	62,376	149,794
Oct. 30	88,860	145,311
Nov. 6	107,000*	133,783

Source: Ward's Automotive Reports †Preliminary *Estimated by STEEL

Phantom Freight

Following a Ford announcement that freight charges had been reduced to dealers more than 1000 miles from the Dearborn, Mich., home plant, General Motors Corp. and Chrysler Corp. both announced a revision in freight rates which is aimed at reducing part of the freight charge differentials in areas far from their home plants.

So-called phantom freight, as it has existed in the auto industry, applies to the previous policy of charging freight on the automobile as though it had been shipped completed from the home plant. Actually the parts are shipped and the car assembled relatively near the point of delivery.

Two implications on the industry are readily apparent: The first is a necessary increase in the prices of cars delivered in the Midwest to absorb this cost; the second, a probable reduction in bootlegging which flourished on the differential.

Three Divisions for AM

Initial speculation in the motor city that the untimely passing of George W. Mason, American Motors Corp. president, would lead to a quick merger of the firm with Studebaker-Packard Corp. is tending to fade.

The new president, George Romney, is seizing the reins with the vigor of his predecessor. Romney pronouncements that the firm will work for an interchange of parts and major components with other manufacturers mean more to newsmen than denials of merger talk. Announcement recently of a new operational program for American Motors makes even more clear the firm's intention to chart an independent course. Romney identifies the new operating units as appliance, export and subsidiaries and special products divisions.

Other major steps already taken in the American Motors program cited by Romney include: Amalgamation of Nash-Kelvinator and Hudson resources into $400 million assets in the parent corporation and subsidiaries; consolidation of Nash and Hudson body styling and Hudson's body building in the American Motors' plants in Wisconsin; integration of manufacture of both lines of cars on a common tooling basis, which is expected to cut costs $15 million to $18 million during the first year of operation; and elimination of duplicate Nash and Hudson warehousing and sales service facilities.

A SCENE FROM A NEW FILM —SEE IT SOON!

Learn what ZINC Die Castings can do for you...

Every design and production engineer should see the new motion picture "DIE CASTING—How Else Would You Make It?" as soon as possible. Produced by the American Zinc Institute, Inc., this brand-new film not only establishes the relationship of die casting to other high speed production methods but it presents the place of zinc among the die casting metals.

Included in the new 35-minute picture are all phases of the die casting process—part design, die design, casting, machining, finishing, and the fields of application. The above picture, for example, is one from a sequence dramatically describing the casting of the 5-foot, one piece Packard radiator grille frame and explaining why it is ZINC. Even though you are now using die castings in the assembly of your products, the film will help you to re-evaluate the die casting process in the light of the latest improvements in this constantly developing industry.

HOW TO SEE THE NEW FILM—
If you have access to projection equipment (the film is 16 mm. Kodachrome with sound) and can arrange to get a group together to see the picture, a print can be borrowed free of charge from the American Zinc Institute, Inc., 60 East 42nd Street, New York 17, New York. When writing, try to give several alternate dates for the showing and advise the size of the audience (you will also receive copies of a new 24-page booklet on die castings for those viewing the film).

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HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

How we opened the door to lower costs for Ford

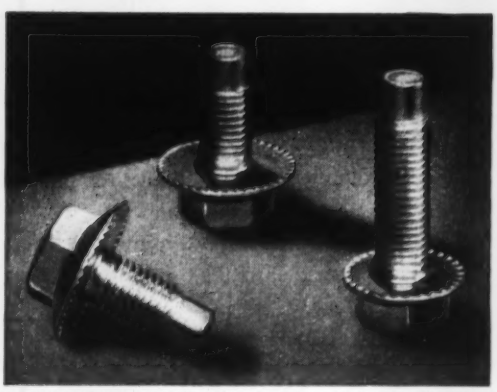
Two hinges on every Ford door. Six screws and 12 washers for each hinge.

Did this present an opportunity for cost reduction? An RB&W "fastener engineer" thought so. And after careful analysis and time studies Ford engineers agreed.

The solution: RB&W Hex SPIN-LOCK screws to fasten the hinge to the door, eliminating the need for washers. And special wide-flange Hex SPIN-LOCK screws for attaching the hinge to the frame, doing away with more washers. The wide flange is necessary to cover an elongated hole in which the hinge moves to permit accurate alignment.

Result — parts requirements are cut by two thirds, assembly is simplified, purchasing and inventory costs are lowered. And RB&W SPIN-LOCK screws hold those door hinges tight for good.

We will be glad to send an RB&W man around to check up on your fastening operations. Every problem is different, of course, but RB&W has a fastener for just about every job. If you need a "special", as Ford did, we'll design and make it for you. Write RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, New York.



FASTER ASSEMBLY, reduced costs were the pay-off, using RB&W designed wide-flange SPIN-LOCK screws (left) for door hinge. Other SPIN-LOCKS (right) hold hinge on door. SPIN-LOCK screws *can't loosen* because ratchet-like teeth lock into surface and hold tight.

3.10

RB&W

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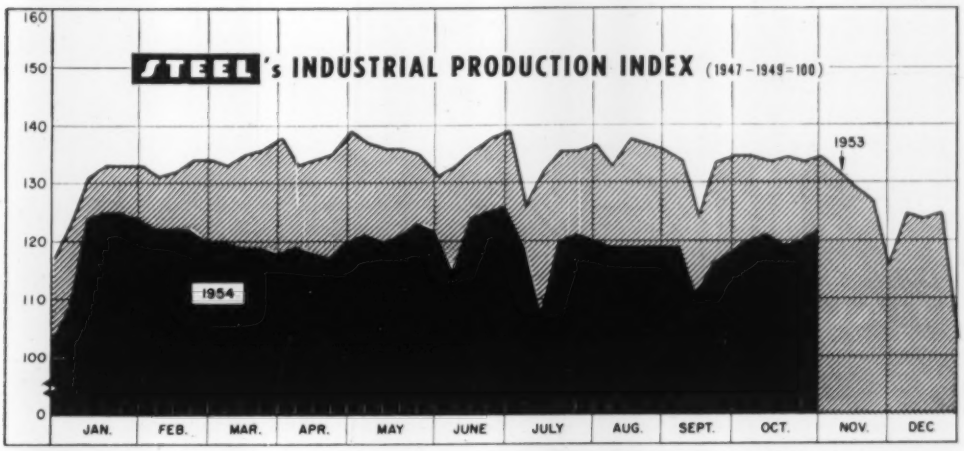

* Week ended Oct. 30.

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%.

Steel, Autos Add Strength to Business Upturn

THE NATION'S economy will continue to gain strength through year end. Plus factors are: Rising steel production, big plans for stepped-up auto output, improvement in the new order and inventory picture and continued high consumer spending.

Steel production is slightly above 75 per cent of capacity. Chances are it will stay at least that high for the rest of the quarter and might get up to 80 per cent before the year is over. Most week-to-week gains will be small but steady.

Plan Record—Auto output in November is scheduled to reach a record 509,000, according to *Ward's Automotive Reports*. That would more than double October's 26-month low of 232,900 units. Chrysler holds the key to the record. That company fell short of its desired October goal because of new model production problems but should have things pretty well smoothed out by now.

Spurring the auto race is the report that General Motors produced 52.6 per cent of the industry's January-October output. Other producers hope to cut GM's share back to around 49 per cent in November. Studebaker got the campaign off to a good start. High demand for their new cars has resulted in a 9-hour day and Saturday work. For months before the new run started, the company was working only about every other week.

Fourth Best — Motor vehicle sales in first 9 months, 1954, were 4,959,297, fourth best in history for the period, says Automobile Manufacturers Association. Better years are 1950 (5,997,984), 1953 (5,764,232) and 1951 (5,407,829).

A good upturn in new orders is reported by National Association of Purchasing Agents. In the association's October survey, reports of increasing new orders outbalance declines by better than 4

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,804	1,776	2,096
Electric Power Distributed (million kwhr)	9,055	9,033	8,362
Bitum. Coal Output (daily av.—1000 tons)	1,473	1,377	1,546
Petroleum Production (daily av.—1000 bbl)	6,157	6,174	6,028
Construction Volume (ENR—millions)	$220.2	$323.2	$289.3
Automobile, Truck Output (Ward's—units)	88,860	62,376	145,311
TRADE			
Freight Car Loadings (unit—1000 cars)	718	746	781
Business Failures (Dun & Bradstreet, no.)	220	229	218
Currency in Circulation (millions)[3]	$29,970	$30,055	$30,268
Dept. Store Sales (changes from year ago)[3]	+9%	+1%	−7%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,591	$21,261	$17,135
Federal Gross Debt (billions)	$278.7	$278.8	$273.3
Bond Volume, NYSE (millions)	$16.6	$18.2	$19.2
Stocks Sales, NYSE (thousands of shares)	10,489	10,454	6,789
Loans and Investments (billions)[4]	$84.7	$84.7	$79.1
U. S. Gov't. Obligations Held (billions)[4]	$37.4	$37.4	$31.6
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.38
STEEL's Nonferrous Metal Price Index[6]	218.4	218.6	204.3
All Commodities[7]	109.6	109.4	110.0
Commodities Other Than Farm & Foods[7]	114.5	114.6	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve Systm. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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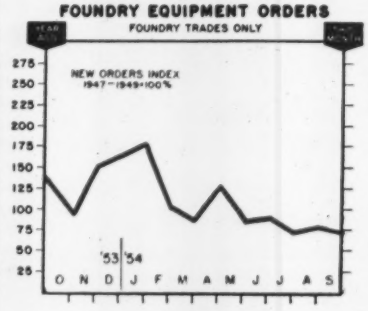
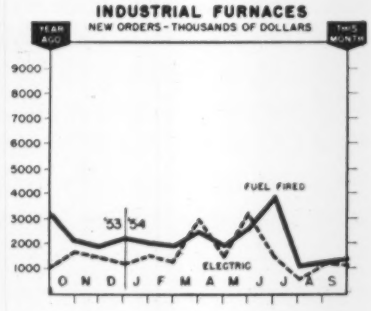
THE BUSINESS TREND



	Index (1947-1949=100)		Value Thousands	
	1954	1953	1954	1953
Jan.	173.8	99.6	$2,463	$1,418
Feb.	99.9	97.5	1,423	1,388
Mar.	82.7	132.2	1,089	1,882
Apr.	125.3	111.8	1,776	1,592
May	80.8	182.1	1,144	2,594
June	86.4	156.4	1,225	2,227
July	68.8	158.9	974	2,263
Aug.	75.6	235.5	....	3,353
Sept.	68.3	127.7	....	1,818
Oct.	....	87.1	....	1,241
Nov.	....	149.4	....	2,128
Dec.	....	160.8	....	2,290

Foundry Equipment Mfrs. Assn.



	New Orders—Thousands of Dollars			
	Fuel Fired*		Electric	
	1954	1953	1954	1953
Jan.	1,865	3,540	1,374	1,655
Feb.	1,758	3,996	1,093	1,672
Mar.	2,346	3,607	2,828	1,301
Apr.	1,734	3,017	1,262	1,796
May	2,423	2,609	3,065	1,799
June	3,724	2,550	1,261	2,095
July	987	2,017	456	2,246
Aug.	1,117	5,465	1,052	1,904
Sept.	1,241	3,019	1,007	873
Oct.	....	1,975	....	1,539
Nov.	....	1,692	....	1,256
Dec.	....	2,013	....	1,014

* Except for hot rolling steel.
Industrial Heating Equipment Assn. Inc.

Charts copyright 1954 STEEL.

The ratio was only 3 to 1 in September.

More Pickup—A majority of the PAs say inventories are at minimum safe operating levels, which means the buying pickup should continue. Some firms are already building up stocks to cover expanded production schedules. Most inventories, though, will stay at about present low levels unless there is a continued lengthening of delivery dates.

Prices are stronger and being maintained, showing a firming of the industrial picture. But sellers aren't letting up a bit in their sales efforts.

Hiring, Hours Gain . . .

Employment is up, and more plants are working full time, but there is little overtime. Autos and appliances are the strong points in the hiring pickup. Thirty per cent of the PAs say employment is up as against 15 who say it's down. That is the first 2 to 1 ratio since June, 1953.

Predictions Hold Up . . .

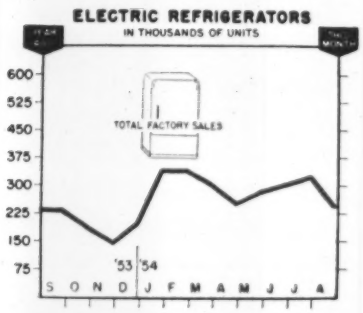
The significance of the PAs' report is pointed up by government figures for September, which bear out the survey's estimates for that month. New orders placed with manufacturers rose to the highest seasonally adjusted rate since the summer of 1953, according to Commerce department's Office of Business Economics. The advance was sharpest in durable goods industries, reflecting increased defense orders with transportation equipment companies.

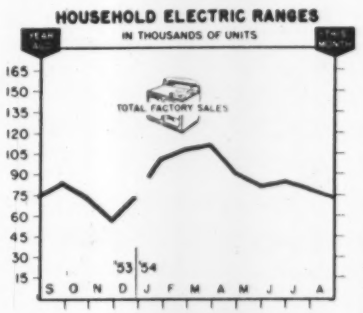
Unfilled orders rose by $400 million, the first increase in nearly 2 years. The increase was about evenly divided between hard and soft goods and concentrated mainly in transportation and textiles.

Sales continued to show slight improvement. Inventories dropped another $300 million, seasonally adjusted, during the month. Manufacturers stocks at the end of the month were about 1.8 months of sales, virtually the same as a year ago when the business dip was just starting. With the upturn under way, producers generally are in a much better position.

All in a Day's Wash . . .

Home laundry appliance makers are tooting their own horns, but with good reasons. Factory sales of 379,666 standard size household washers in September were highest since October, 1950. Dryer sales were at an all-time high of





Total Factory Sales—Units

	1954	1953	1952
Jan.	101,870	88,145	79,982
Feb.	109,617	114,465	63,063
Mar.	112,232	130,788	93,225
Apr.	90,940	118,999	69,149
May	82,649	114,404	68,117
June	85,854	113,086	86,817
July	80,017	77,836	83,465
Aug.	74,283	74,326	74,853
Sept.	.....	84,481	62,404
Oct.	.....	73,422	63,143
Nov.	.....	55,748	72,982
Dec.	.....	73,870	84,630
Total	.....	1,119,570	901,860

National Electrical Mfrs. Assn.

Total Factory Sales—Units

	1954	1953	1952
Jan.	344,101	325,186	260,259
Feb.	334,122	377,605	259,838
Mar.	303,535	368,498	276,972
Apr.	249,388	366,951	225,994
May	282,164	317,667	217,017
June	303,127	343,114	324,885
July	325,061	298,838	333,877
Aug.	240,693	232,981	250,224
Sept.	.....	231,224	230,111
Oct.	.....	179,749	207,065
Nov.	.....	139,563	256,530
Dec.	.....	197,102	248,506
Total	.....	3,378,478	3,091,434

National Electric Mfrs. Assn.

107,084, compared to 86,461 in the next highest month, September, 1953. Ironer sales of 8905 gained more than 50 per cent since August.

Says Guenther Baumgart, executive director of American Home Laundry Manufacturers Association: "Those records reported for September attest the accuracy of industry members' predictions as to substantial fall gains, as reported last summer by W. Home Reeve, association president." Their forecast is further supported by comparing September sales with those for the same month in 1953. Washers are up 11.5 per cent, dryers, 23.9 per cent. Ironers trail last September by only 2.3 per cent.

Voting for More Upturn . . .

Within the industry, producers are setting some records of their own. Whirlpool Corp.'s daily production of home laundry appliances for the last three weeks has been highest in the firm's history, says Elisha Gray II, president. Turned out daily were 6000 units, compared to 3700 daily last year. So far this year, the company's output is about 25 per cent ahead of the 1953 period.

Another voice has been added to the predictions of a coming increase in farm equipment. This time it's Henry Ford II. "I am sure you can look forward to a better year in 1955," he told about 150 representatives of Ford tractor and implement distributors for the U.S., Canada, Cuba and Mexico who previewed the 1955 sales and service program.

Trends Fore and Aft . . .

Commercial heat treating firms are holding on to gains achieved since the year's low in July, according to Metal Treating Institute . . . Freight car loadings for revenue made their best showing of the year in the week ended Oct. 23, according to Association of American Railroads. The 746,000 cars loaded were highest for any week since Nov. 7, 1953, and came closest of any week this year to year-ago figures . . . Factory workers in September could buy more goods and services with their take-home pay than in the same month in any postwar year, says Labor Secretary James P. Mitchell . . . Television hit an all-time weekly high of 228,298 sets in late October, reports Radio - Electronics - Television Manufacturers Association.

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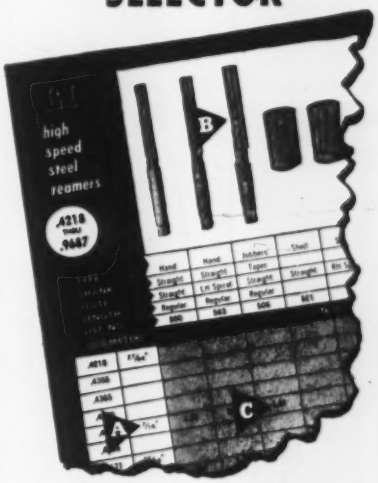

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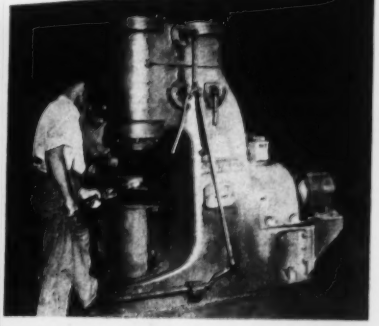
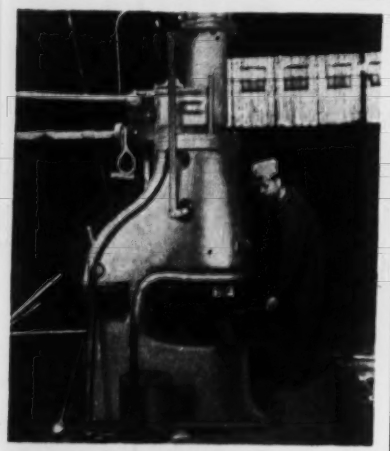

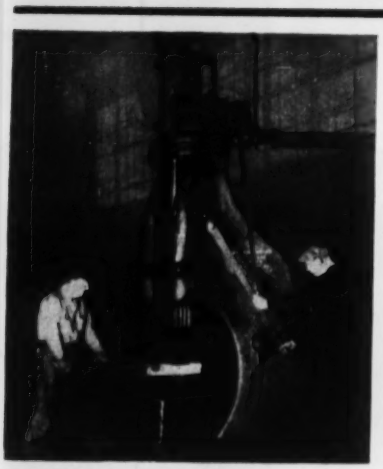
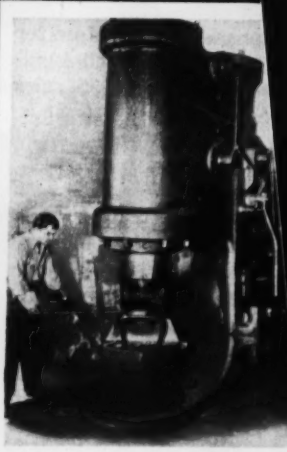

CALL it what you will, you have the choice of two superior hammers: the Chambersburg High Frame Hammer, operating on steam or air; and the Chambersburg Motor Driven Pneumatic Forging Hammer, which can operate anywhere, independent of steam or air lines. The High Frame Hammer has ample working space, adaptable to the forging of large discs and rings, the upsetting of high stems, etc., and has many other outstanding features. The Pneumatic Forging Hammer is completely self-contained, with its motor driven compressor built-in. It is capable of greater forging output than any other hammer of its type.

Either or both hammers, whether it be a 150 lb., a 600 lb. or a giant 6000 lb., will represent a profitable investment for your flat die, blacksmithing or tool dressing needs. Write today for Bulletins 1-L-9 and 16-L-9.

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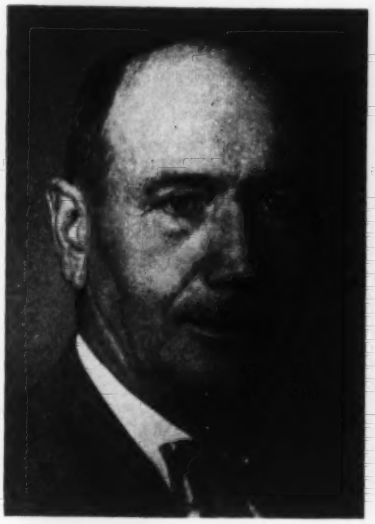


FRANK KLIMA
. . . mgr. at Kaiser Aluminum's Erie plant

ARTHUR W. OSTRANDER
. . . Enterprise Engine gen. sales mgr.

R. L. GRAY
. . . Armco Steel executive v. p.

Frank Klima was appointed manager of **Kaiser Aluminum & Chemical Corp.'s** newly acquired aluminum forging plant at Erie, Pa. He will report to **J. T. Dugall,** manager of the Newark, O., rod, bar, wire and electrical conductor plant, who will administer both facilities. Kaiser Aluminum is operating the Erie facility under lease granted by the General Services Administration. The plant is producing aircraft and ordnance forgings.

Philip W. Chase was appointed assistant vice president-raw materials, **United States Steel Corp.,** Pittsburgh. He succeeds **H. D. Moulton,** elected president of United States Steel Homes Inc., subsidiary. **August J. Breitenstein** was made director-exploration and planning, adding to his former responsibilities those previously held by Mr. Chase. Mr. Breitenstein, since 1953, has been serving as director of planning in the raw materials division.

Ralph W. Gundersen was made chief industrial engineer, **American Hoist & Derrick Co.,** St. Paul.

Ben A. Fleury was appointed Chicago district manager for **Union Twist Drill Co.** He was connected with Charles Products Co. and served as vice president for the last two years.

Arthur W. Ostrander was appointed general sales manager, **Enterprise Engine & Machinery Division,** General Metals Corp., San Francisco. He was formerly executive vice president of American Farm Machinery Co. and before that was vice president-sales, Farmhand Division, Superior Separator Co.

Robert W. Bowman was appointed chief industrial engineer, **Aeroquip Corp.,** Jackson, Mich. He was chief of methods and standards for Kawneer Mfg. Co. before joining Aeroquip in 1953 in the same capacity. **Kent R. Manning** was made factory manager. He will direct plant operations, plus the methods and standards, production control and purchasing departments.

Ernest Davis was promoted to vice president, **Kickhaefer Mfg. Co.,** Milwaukee. He formerly served as secretary. **Emil Kessler** was made plant superintendent.

Dr. Ernest A. Lederer was promoted to the newly created position of chief engineer for **Westinghouse Electric Corp.'s** electronic tube division at Horseheads, N. Y.

Henry F. Watkins was appointed chief industrial engineer, **Mather Spring Co.,** Toledo, O. He was formerly with Barrett Division, Allied Chemical & Dye Corp.

R. L. Gray was elected executive vice president, **Armco Steel Corp.,** Middletown, O. He has been a director and senior vice president. He also has been president of Sheffield Steel Corp., subsidiary of Armco, which recently became Sheffield Steel Division. **H. H. Tullis** and **R. S. Gruver,** vice presidents of Armco, were elected administrative vice presidents. **John W. Anderson** succeeds Mr. Gray as president of Sheffield, which he has served as vice president in charge of sales and related activities.

Robert W. McKittrick was made assistant manager of **National Lead Co.'s** Chicago branch in charge of secondary metal operations. He continues supervision of antimonial lead sales for the branch.

Lawrence A. Hyland was elected vice president and general manager of **Hughes Aircraft Co.,** Culver City, Calif. He resigned as vice president-engineering at Bendix Aviation Corp.

F. G. Treat, vice president-general manager at **Riley Stoker Corp.,** Detroit, was transferred to Worcester, Mass., to head production for the firm's boiler division, Badenhausen Corp., at Cornwells Hts., Pa., as well as the fuel burning and stoker division at Detroit. **F. R. Mason,** formerly plant super-

HARRISON O. ASH
. . . heads Aluminum Industries

P. A. HASSELL
. . . mgr. of new Magnethermic div.

S. D. CLARKE JR.
. . . Rust Eng. purchasing agent

intendent, was made general manager. **Lloyd Lavictoire** is superintendent.

Harrison O. Ash was elected president and general manager of **Aluminum Industries Inc.**, Cincinnati. He succeeds **John W. Craig**, who resigned to become vice president-general manager of RCA-Victor Home Appliance Division, Radio Corp. of America.

Dumore Precision Tools, Racine, Wis., named **James P. Steibel** manager-research and development; **Logan H. Cashman**, purchasing agent; **George B. McManners**, advertising manager; **Lester J. La Mack**, sales manager; and **Herbert Ainsworth**, district sales manager at Detroit.

Robert J. Jespersen was elected vice president and controller of **Kaiser Motors Corp.** and **Willys Motors Inc.**, Toledo, O. Affiliated with the Kaiser interests for 13 years, he replaces **George L. Palmer** as chief finance officer of the company.

E. C. Freeman was made factory manager, **Norman R. Reno**, master mechanic, and **Robert W. Fries**, planning superintendent of the marine and industrial engine division, **Chrysler Corp.**, Detroit.

John C. Neely will head sales of fabricated aluminum structural products at **Reynolds Metals Co.'s** building products division, Louisville, a newly created position.

P. A. Hassell was appointed manager of the newly formed high-frequency induction heating division of **Magnethermic Corp.**, Youngstown.

John V. Burley was made an assistant general manager of sales for **Republic Steel Corp.**, Cleveland. He is succeeded as manager of bar division sales by **Henry P. Rankin Jr.**, formerly assistant manager. **Charles W. Barrett** was made manager of Republic's Buffalo district operation and is succeeded as assistant manager by **Harry H. Northrup**, who has been superintendent of the open-hearth department.

S. D. Clarke Jr. was named purchasing agent, **Rust Engineering Co.**, Pittsburgh. Before joining Rust's purchasing staff in April, Mr. Clarke was purchasing agent for Kerotest Mfg. Co.

Myron H. Watkins, general manager-sales, and **George McCuskey**, assistant to the president, were elected vice presidents, **Youngstown Sheet & Tube Co.**, Youngstown. Mr. Watkins will devote his time to sales, Mr. McCuskey to financial matters.

Herbert L. Waltman was named manager, Pacific Northwest district, **Leschen Wire Rope Division**,

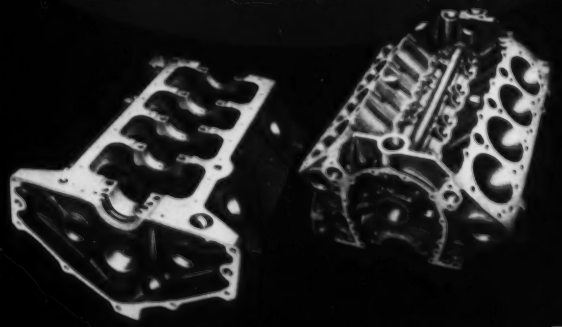
JOHN V. BURLEY

HENRY P. RANKIN JR.

. . . Republic Steel Corp. sales appointments

350 Foot Automation Line Performs 555 Operations on V-8 Cylinder Blocks

Another Transfer-matic by Cross



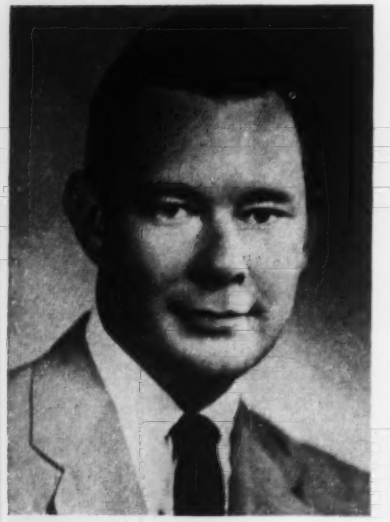
- ★ 100 pieces at 100% efficiency.
- ★ Operations: 265 drilling, 6 milling, 21 boring, 56 reaming, 101 countersinking, 106 tapping, and 133 inspection.
- ★ 104 stations: 1 for loading, 53 for machining, 7 for part handling, 6 for mechanical inspection, 36 for visual inspection, 1 for unloading.
- ★ 5 independent machine sections with provision for banking parts between each section; master automatic cycle for operating all 5 sections simultaneously.
- ★ Capacity for removing work piece at every station.
- ★ Automatic independent transfer mechanism for each machine section and automation units for handling parts from machine section to machine section.
- ★ Automatic air pressure test for high pressure oil holes and automatic depth inspection for all holes before tapping.
- ★ Pre-set tooling throughout.
- ★ Other features: Coolant system for tapping section, complete interchangeability of all standard and special parts for easy maintenance, construction to J.I.C. standards, hardened and ground ways, hydraulic feed and rapid traverse, automatic lubrication, automatic chip disposal.

Established 1898

THE CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS



R. M. MILLER
. . . Stearns Magnetic v. p.

ALFRED H. LEWIS
. . . Vacuum Metals sales manager

GEORGE M. COFFEY
. . . Wagner Electric brake sales mgr.

H. K. Porter Inc. He has headquarters at Seattle.

R. M. Miller was elected vice president, **Stearns Magnetic Inc.**, Milwaukee. Formerly manager of the firm's transmission plant, he will be responsible for sales, production and engineering activities of the company.

Carl K. Madison, midwestern regional manager for **Rockwell Mfg. Co.**, Pittsburgh, was promoted to vice president in charge of new product sales in its meter and valve division.

Ferro Corp., Cleveland, elected **John A. Sullivan** president of three subsidiaries: Tuttle & Kift Inc., Chicago; Ferrod Mfg. Co., Batavia, Ill.; and Ferro Electric Products Inc., Kirkland, Ill. Mr. Sullivan replaces **C. D. Clawson**, who assumes full time duties as president of the parent corporation.

Alfred H. Lewis was appointed sales manager of **Vacuum Metals Corp.**, with headquarters at the new plant in Syracuse, N. Y. He was formerly branch sales manager at Syracuse for Crucible Steel Co. of America.

T. J. Ault succeeds **J. Rodger Dryden** as president and general manager, **Long Mfg. Division**, Borg-Warner Corp., in Detroit. Mr. Dryden becomes chairman of the board of the division to succeed **J. Lester Dryden**, retired. For the present Mr. Ault also retains the position of president and general manager, Detroit Gear Division. Retirements of other Long division executives include: **M. J. Brinkman**, executive vice president; **L. J. Loranger**, a vice president; and **W. F. Burgess**, secretary-treasurer. **Royden Walters**, Detroit Gear secretary-treasurer, will also serve Long in the same capacity.

George M. Coffey was appointed manager of industrial brake sales, **Wagner Electric Corp.**, St. Louis. He will co-ordinate sales of industrial crane bridge brakes through the firm's branch offices.

West Coast Electronics Co., Los Angeles, elected **Bruce A. Worcester**, president; **Howard P. Gates**, vice president-engineering; **Howard B. Grove**, vice president in charge of military technical liaison and field service.

Roman J. Meyer, general superintendent of the Fairfield sheet mill of United States Steel Corp.'s **Tennessee Coal & Iron Division**, Birmingham, was promoted to manager of manufacturing operations for the division. He replaces **James C. Gray**, now U. S. Steel vice president-coal mines.

A. F. Milbrath, chief engineer and vice president, **Wisconsin Motor Corp.**, Milwaukee, has retired.

OBITUARIES . . .

Harry E. McMinn, 62, director, secretary and chief engineer, **Guibert Steel Co.**, Pittsburgh, died recently.

Swain J. Swainson, 53, for many years director of **American Cyanamid Co.'s** mineral dressing laboratories at Stamford, Conn., died Oct. 22.

Richard E. Holmes, chief engineer, air conditioning and refrigeration division, **Worthington Corp.'s** Holyoke, Mass., Works, died Oct. 15.

Earl W. Wiggins, 44, works manager, **Unit Crane & Shovel Corp.**, West Allis, Wis., died Oct. 19.

Albert B. Dick Jr., 60, chairman of the board of **A. B. Dick Co.**, Chicago, died Oct. 24.

John P. Barclay, chairman, president and general manager, **Wire Rope Corp. of America Inc.**, St. Joseph, Mo., died Oct. 16.

William W. Moore, 57, manager of the Toledo, O., district office of **Allis-Chalmers Mfg. Co.'s** general machinery division, died Oct. 20.

Philip S. Barnes, 63, retired manager, chemical equipment sales department, **Pfaudler Co.**, Rochester, N. Y., died Oct. 19.

Announcing...*the* NEW

Kearney & Trecker

3 hp No. 2 — 7½ hp No. 3

Model CE

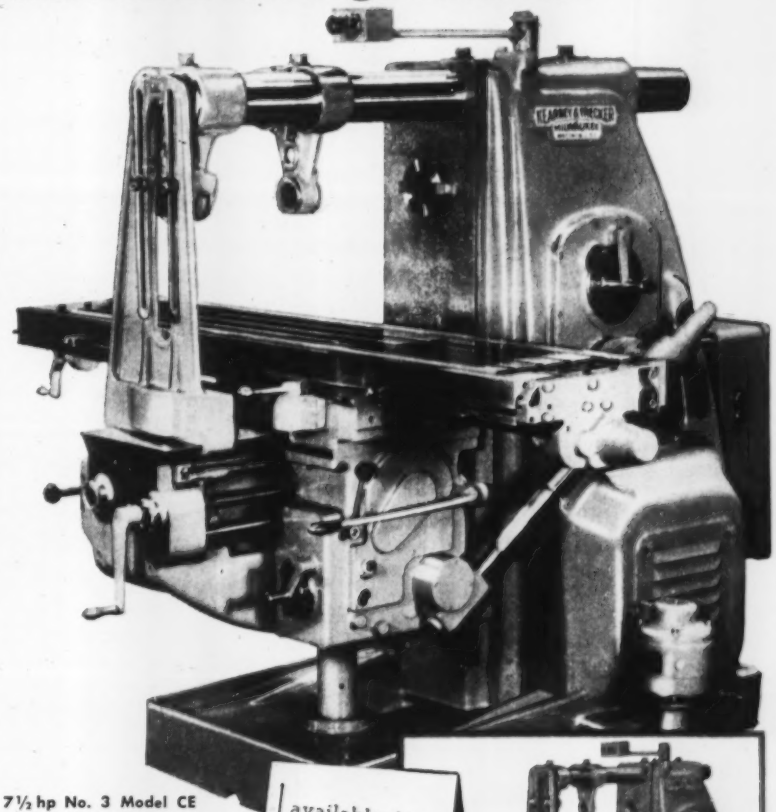
plain and universal milling machines

Designed specifically for EFFICIENCY, EASE and ECONOMY of operation

HERE'S Kearney & Trecker's answer to industry's need for a new milling machine that combines quality with *low initial cost.* The new Model CE's give you the three most wanted features — *Efficiency, Ease* and *Economy* of operation. What's more, these machines can be obtained under Tool-Lease.

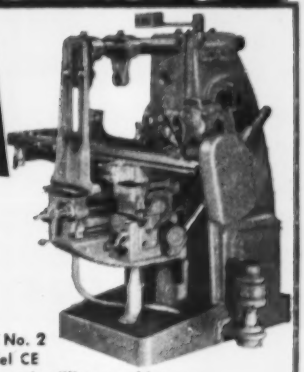
The economical Model CE's are available in either No. 2 (3hp) or No. 3 (7½hp) size — both in plain and universal styles. The CE's feature 16 quick-change speeds (25 to 1300 rpm) and feeds (½ to 25 ipm). They are ideally suited for a wide variety of applications — especially for small tool shops, repair and maintenance shops and vocational training schools.

For the full story, contact your nearest Kearney & Trecker representative, or write: Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.



7½ hp No. 3 Model CE plain milling machine
NOTE: Standard equipment includes choice of only one arbor support. Overarm brace available at additional cost.

available for TOOL-LEASE



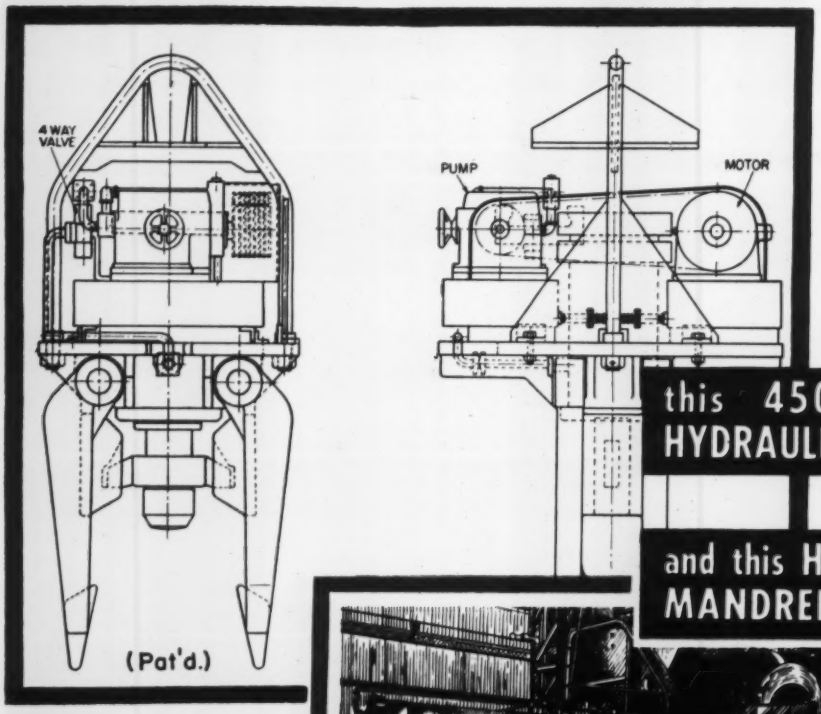
3hp No. 2 Model CE universal milling machine
NOTE: Standard equipment includes choice of only one arbor support. Only Conventional Lead Attachment (shown above) is available in Model CE Universal machines. Overarm brace available at additional cost.

FREE CATALOGS! Ask for complete data on Model CE milling machines, catalog No. CE-10, and for Tool-Lease bulletin, TL-10A. Also see our catalog in Sweet's. Write or call Kearney & Trecker Corp. — Telephone: GReenfield 6-8300.

Kearney & Trecker Corp.

MILWAUKEE 14, WISCONSIN

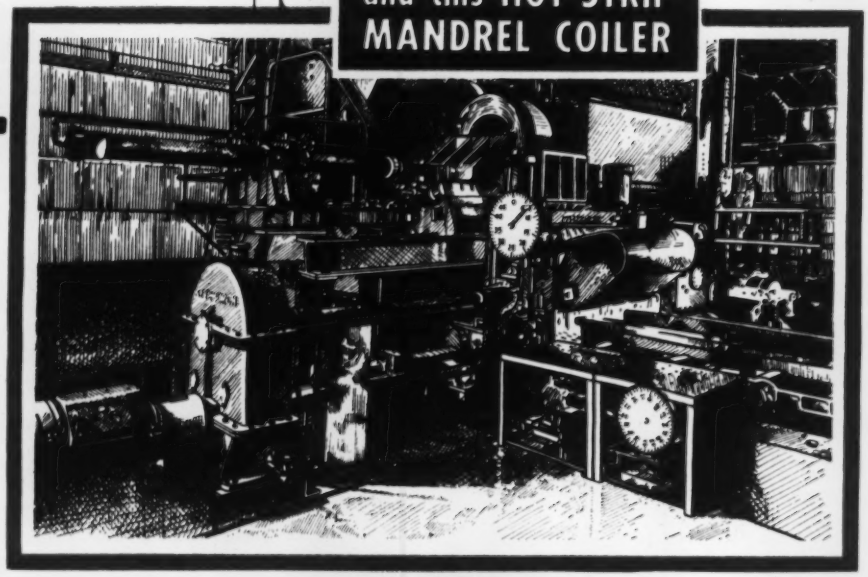
our job is to CUT COSTS



that's why we were retained to design and build

this 450-TON PORTABLE HYDRAULIC INGOT STRIPPER

and this HOT STRIP MANDREL COILER



We welcome the opportunity to serve you.

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DIVISION OF PITTSBURGH STEEL FOUNDRY CORP.

Kaiser Expands Plant

Alumina capacity of Baton Rouge facility is raised to over 800,000 tons a year

EXPANSION of Kaiser Aluminum & Chemical Corp.'s plant at Baton Rouge, La., is nearing completion. The $27-million, three-year project raises the plant's capacity to over 800,000 tons of alumina a year.

The final phase, now under way, increases the plant's production to provide the alumina requirements of the company's reduction plants at Chalmette, La., and Tacoma and Mead, Wash. Their primary aluminum capacities total over 400,000 tons a year.

The Baton Rouge project, part of a $230-million integration and expansion program, includes facilities for processing bauxite from the corporation's mines in Jamaica, British West Indies.

Triple Capacity—The new additions, which affect virtually every major step in the plant's operation, more than triple its original capacity, which was 240,000 tons when Kaiser took over the facility in 1946.

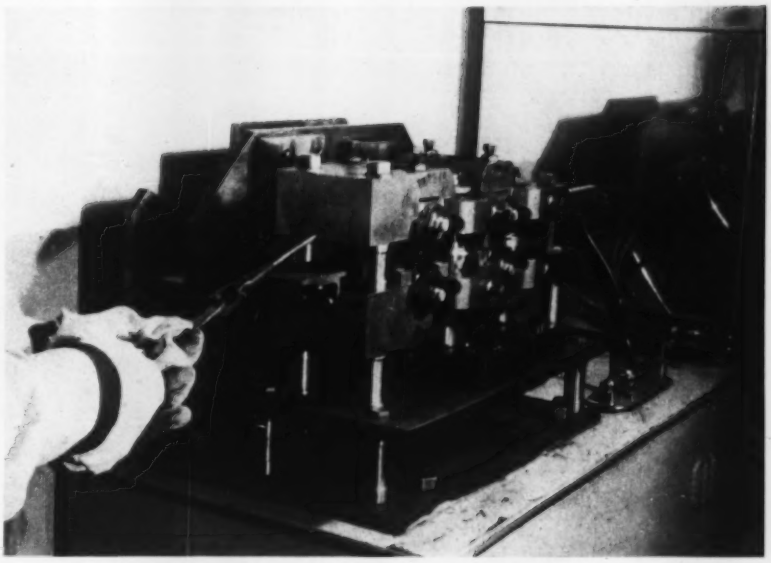
Major portion of the extensive construction has been completed. Among the important units are:

1. One of the nation's largest single evaporator ore capacities, totaling 1.1 million pounds per hour of evaporation.
2. Erection of some 20,000 tons of structural steel, plus installation of about 112 miles of steel pipe, ranging up to 60 in. in diameter.
3. Construction of 51 six-story-high precipitators and other container-type structures with capacities adding 2.5 million cu ft of tanks to the plant.
4. Doubling the number of rotary kilns—each of the five largest are nearly 10 ft in diameter and 256 ft long.

These, and other improvements, make possible the handling of over 2 million tons of bauxite a year.

Harnischfeger Opens Branch

Harnischfeger Corp.'s Welding Division, Milwaukee, opened a district office at 815 Superior Ave., Cleveland. A. T. Mortrud is district manager.



Bethlehem Laboratory Develops Miniature Rolling Mill

This 3-in. continuous rolling mill was developed and built by Bethlehem Pacific Coast Steel Corp., Bethlehem, Pa. Cast steel samples are heated in a small induction furnace, then reduced from 5/16 to 7/32-in. diameter by passing through the mill's two horizontal and two vertical stands of rolls. They are caught with steel tongs by a laboratory technician as they leave the final roll stand. After water cooling, the samples are cut, ground and analyzed spectrographically

Firth-Loach Starts Operations

Operation of Firth-Loach Metals Inc., newest entry in the rapidly growing carbide field, is under way at the company's new McKeesport, Pa., plant. L. Gerald Firth is president.

Westinghouse Buys Schneider

Westinghouse Electric Corp., Pittsburgh, purchased Schneider Mfg. Corp., Muncie, Ind., manufacturer of torque converters. Westinghouse produces many types of gears, including power transmissions, at its Nuttall, Pa., plant.

York Realigns Organization

York Corp., York, Pa., has realigned its organization. Three self-contained divisions are responsible to the president, Stewart Lauer. Under the plan, division heads are responsible for the profits of their operations; the president, in turn, is responsible to directors for the combined operation. Industrial Division is headed by R. K. Serfass, vice president and general manager; Commercial Division, J. K. Louden, vice president and general manager; International Division, C. B. Morrison, managing director.

Canadian Electric Wire Formed

Canadian Electric Wire Ltd. has been formed to manufacture wire for wire weaving, electrical and other industrial purposes. A plant in Perth, Ont., is expected to start production in January.

Whitin Machine Diversifies

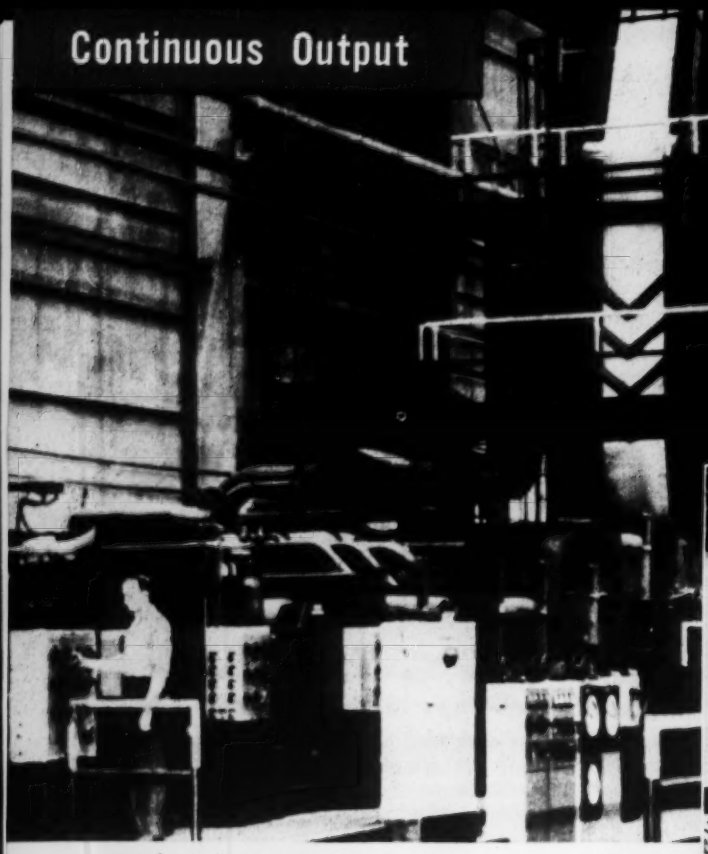
Whitin Machine Works, Whitinsville, Mass., maker of textile machinery, plans to manufacture a new line of offset duplicating equipment for use in offices. Production is expected to start early in 1955.

Torrington Renames Division

Torrington Mfg. Co., Torrington, Conn., changed the name of its Spring Machinery Division to Wire Forming Machinery Division. The company recently started production of four slide machines, torsion spring winding machines and precision carbide tools for

(*Please turn to page* 76)

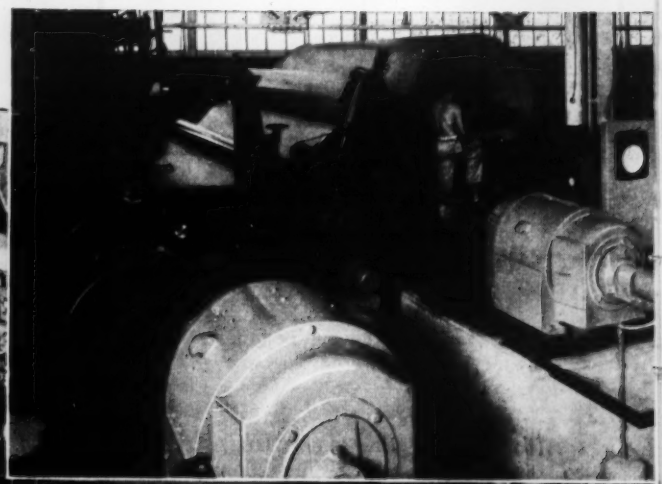
Continuous Output

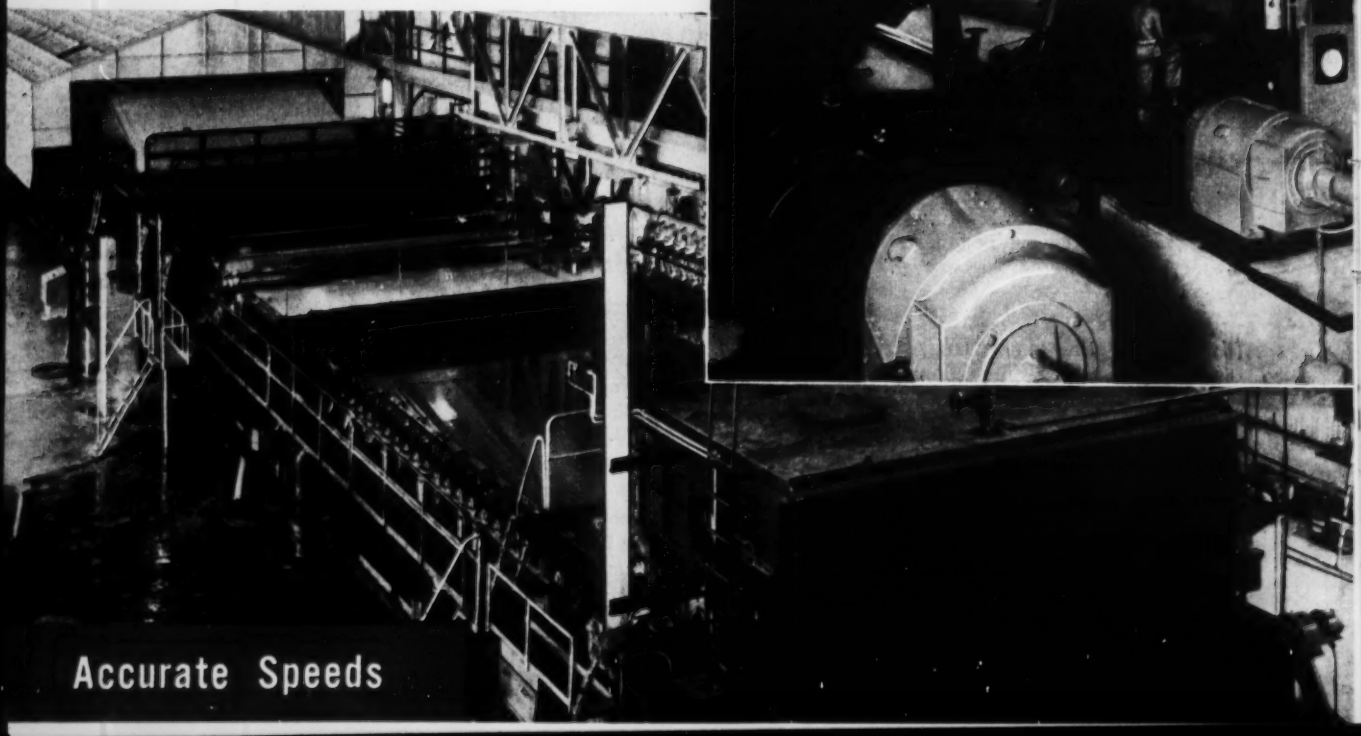


Co-ordinated G-E drive and furnace help produce up to 30 tons/hour of annealed strip. Adjustable voltage d-c generators co-ordinated by modern control provide smooth, fast, precise operation.

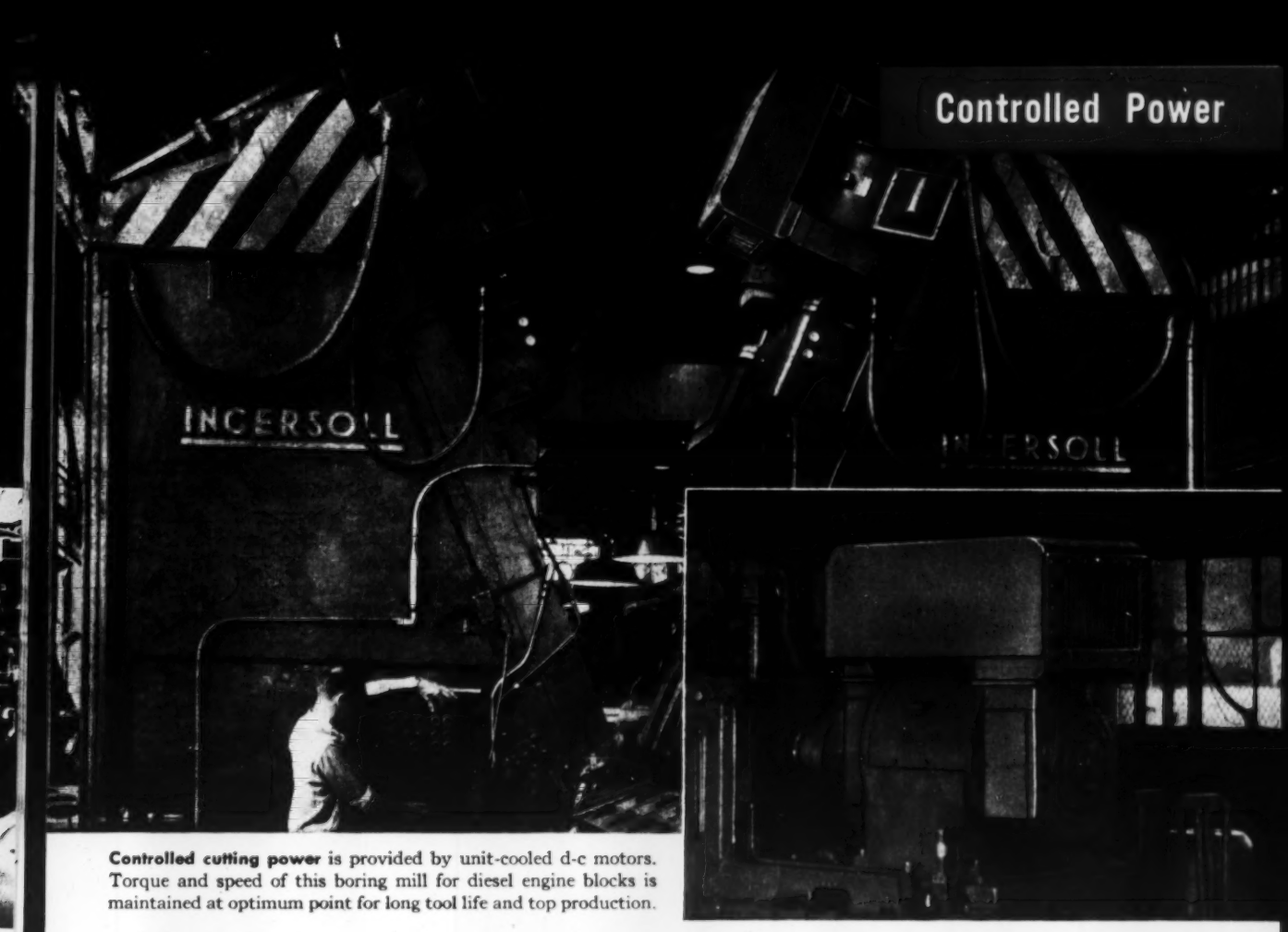
How General Electric d-c drives

Accurate speed from d-c drive co-ordinates sections of paper machine into fast flow of production—up to 300 tons/day. Mechanical design of machine is simplified, output increased.





Accurate Speeds



Controlled cutting power is provided by unit-cooled d-c motors. Torque and speed of this boring mill for diesel engine blocks is maintained at optimum point for long tool life and top production.

help make production automatic

DC MOTORS STEP UP PRODUCTION THROUGHOUT INDUSTRY

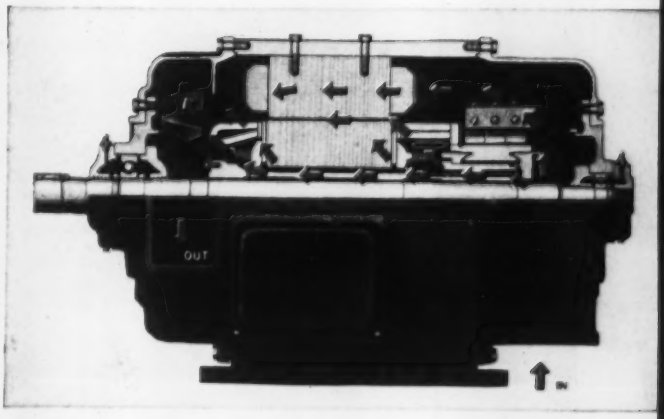
DC drives give you precise control of torque, speed, and power —essential in automatic production. The degree of precision depends on the steady performance and continuity of service of d-c motors and generators. In applications requiring close speed regulation, quick reversing, severe peak loads, G.E.'s complete line of Type CD-1000 motors is:

ECONOMICAL—the right speed at all times means less waste, fast production and low manufacturing costs per unit.

EASY TO MAINTAIN—built for long life with occasional inspection only—easily removable inspection covers. All connections are enclosed, yet easily accessible.

VERSATILE—Today's industry is more automatic than ever before. Regardless of application—in steel, paper, machine tool, and many other industries—G-E direct-current motors have gained the reputation of delivering continuous output at lower costs and accurate speeds for peak production.

FOR MORE INFORMATION, contact your nearest Apparatus Sales representative, or write for bulletin GEA-5497, general-purpose d-c motors, or GEA-6091A, totally-enclosed unit-cooled d-c motors. Section 810-4, General Electric Co., Schenectady, N. Y.



Excellent ventilating system gives positive ventilation to entire motor. Shaft fan on armature helps dissipate heat and keeps motor within rated temperature rise.

GENERAL ELECTRIC

(*Concluded from page 73*)

spring machinery. Output of the division formerly was limited to machines to produce conventional extension and compression springs. Other divisions produce more than 325 different air impellers and several types of auxiliary mill machinery.

Garrett To Enlarge Plant

Garrett Corp., Los Angeles, plans to enlarge and improve its AiResearch plant at Phoenix, Ariz. The $400,000 project will provide additional space for assembly and overhaul, a painting department, process laboratory and plating shop. Also included are a new water reservoir and pump for additional fire protection.

Colson Broadens Operations

Colson Corp., Elyria, O., manufacturer of casters, wheeled products for institutions and material handling equipment for industry, is building a 40,000-sq-ft plant in that city. It will be devoted to production of industrial trucks.

Colson also has entered into an agreement with Structo Co. Ltd., Ottawa, Ont., which gives the firm exclusive manufacturing and distribution rights to introduce Structo steel framework angles in the United States.

Pressed Steel Car Renamed

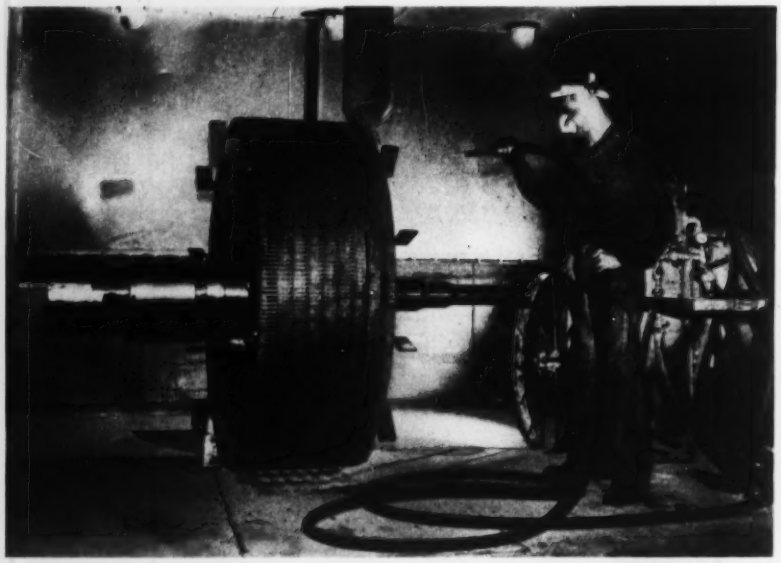
Pressed Steel Car Co. Inc., New York, changed its name to U. S. Industries Inc. Change in the corporate name was made in line with the company's product and geographical diversification.

Prat-Daniel Buys Product Line

Prat-Daniel Corp., South Norwalk, Conn., acquired the patents, sales and manufacturing rights of the gas-fired infrared industrial and commercial heating device developed by Day & Night Division of Affiliated Gas Equipment Inc., Monrovia, Calif. The new line will be added to Prat-Daniel's line of direct-fired warm air industrial heating equipment.

Regal-Lite Corp. Formed

Regal-Lite Corp., Providence, R. I., is developing a line of brass and bronze electrical fixtures. Manufacturing operations by the new firm have begun in a 22,000-sq-ft building.



Westinghouse Cleans Motors with Corn Cob Particles

Corn cobs, reduced to the size of lake sand, are used as both an abrasive and an absorbent in the air blast cleaning of industrial equipment at Westinghouse Electric Corp.'s plant in Chicago. Rotor of a water-damaged electric motor is shown receiving this unique treatment. More than 200 motors, from fractional to 500 hp, were cleaned in this manner recently following a flood in that area

Blaw-Knox Plans To Build

Mattoon plant will increase firm's capacity to make road building machinery

BLAW-KNOX CO., one of the nation's largest suppliers of road building machinery, is confident there will be an early and substantial increase in highway construction (STEEL, Nov. 1, p. 40). The Pittsburgh firm, preparing to meet it, will build a plant at Mattoon, Ill., where it will manufacture its full line of road building equipment.

"Whether Congress approves the President's proposed $50-billion highway program, or whether road building expansion develops from critical need, the pressing demand for additional national, state and local highways cannot long be postponed," says W. Gordes Snyder Jr., president of Blaw-Knox.

Combines Units—The Mattoon plant will combine three widely scattered plants, which make steel road forms, cement and aggregate batching plants, concrete paving mixers, asphalt paving machines, road subgraders, wideners, base pavers, concrete spreaders and finishers, truck mixers and a new super asphalt paver-finisher.

The plant will provide additional production capacity. It is scheduled for completion in late 1955.

A company plant operating in Elyria, O., will be retained by Blaw-Knox for experimental purposes, permitting the company to continue to produce new and improved machines for the road building industry. The plant at Nunda, N. Y., will be closed.

Lunkenheimer Co. Expanding

Lunkenheimer Co. has started a program of consolidation and expansion. A factory, devoted to iron and steel valve machining operations, will be erected next to its present Fairmount plant in Cincinnati, which produces bronze valves.

New Firm Gets Conveyor Line

A new firm, Whirl-Air-Flow Corp., 4718 Touhy Ave., Lincolnwood, Ill., purchased the Pneumatic Sand Conveyor Division of Gerwin

Vanadium-Alloys Steel Company

first quality* Die Steels for hot work

made with the craftsmanship of lifetime specialization in Tool Steel—exclusively

Hotform The first 5% chromium hot work die steel—still first in strength and toughness combined with high resistance to heat checking. *Uses:* die casting dies, dummy blocks, extrusion dies, backer blocks, mandrels, hot piercers, hot forging dies.

Forge Die Resists softening at elevated temperatures, stays put under impact. 14% tungsten content. *Uses:* forge die inserts, extrusion dies, gripper dies, hot pressing dies, dummy blocks, hot piercing tools.

SC Special 14% tungsten plus increased carbon for higher wear resistance. *Uses:* hot forging dies and punches, extrusion tools, hot forming rolls.

Marvel 10% tungsten for high resistance to high temperatures. *Uses:* brass forging dies, extrusion press tools, nut dies and piercers, hot shears, hot swaging dies.

Hotpress Outstanding tungsten die steel with excellent toughness for work at elevated temperatures. *Uses:* dummy blocks for brass extrusion, press dies, extrusion dies, upsetting dies.

WW Hotwork Highly alloyed for greatest wear resistance at high temperatures. *Uses:* copper and brass extruding dies, brass die casting dies, copper tubing piercers, nozzles for zinc die casting machines.

Red Cut Superior—J Temper

Tungsten High Speed Die Steel, with high hot hardness and wear resistance qualities. *Uses:* hot press dies for copper and brass, extrusion dies. hot and cold trim dies, punches, heading dies.

*guaranteed by deep etch, magnaflux, zyglo, and supersonic testing

VANADIUM-ALLOYS STEEL COMPANY

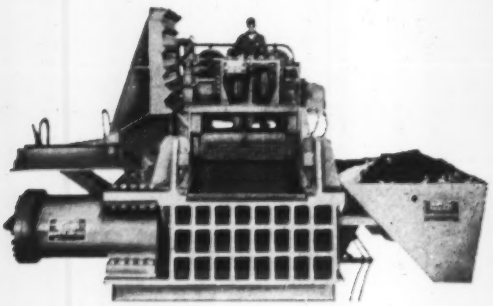
Manufacturers of First Quality Tool and Die Steels

Latrobe, Pennsylvania

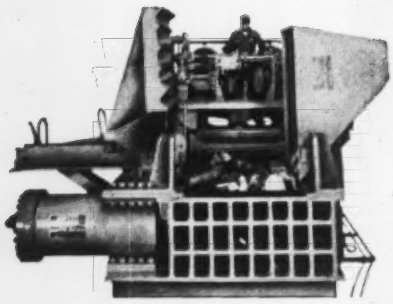
COLONIAL STEEL DIVISION • ANCHOR DRAWN STEEL CO.

In Canada:

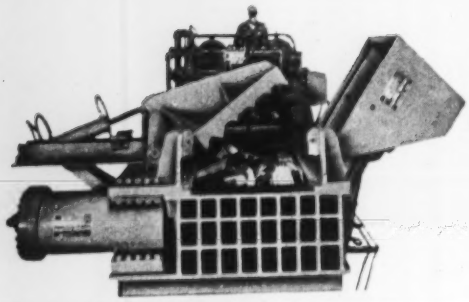
Vanadium-Alloys Steel Canada Limited, London, Ontario



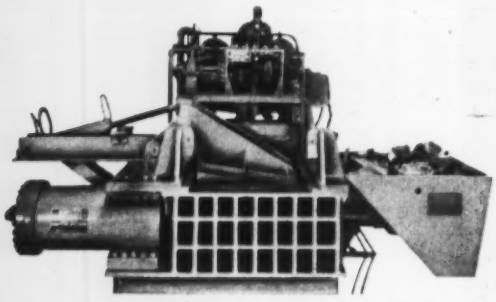
1. Here Skip Pan has been loaded.



2. Skip Pan dumps load into charging box.



3. Auxiliary-Compression Door starts its compression stroke as Skip Pan returns to be re-loaded.



4. Auxiliary-Compression Door crushes scrap into charging box.

5. At right the Auxiliary-Compression returns to up-right position and charging box door closes. Scrap is baled and then ejected. Skip Pan has been re-loaded and is ready to re-fill the charging box.

Dempster-Balester Auxiliary-Compression Door becoming a MUST for scrap metal baling

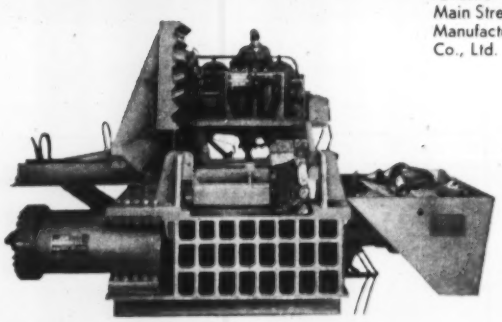
Before buying a scrap metal baling press, it is important to know that the Auxiliary-Compression Door is available exclusively for Dempster-Balesters. This door completely eliminates in some operations and materially reduces in others the costly process of tying up two or three extra men as arrangers. In addition, the hydraulically operated Auxiliary-Compression Door normally crushes scrap with one stroke . . . permitting charging box cover door to close immediately. This means a tremendous increase in production.

This increase in production and savings in man-hour costs have made the Auxiliary-Compression Door virtually indispensable for the greatest economy in scrap metal baling.

A Dempster-Balester Model 600 is shown in operation with Skip Pan Loader and Auxiliary-Compression Door. Note that every operation in the baling cycle is hydraulically controlled from the moment scrap is dumped into Skip Pan Loader until finished bale is ejected.

Write us for complete information. Dempster-Balesters are manufactured exclusively by Dempster Brothers, Inc.

IN CANADA: Sold by W. P. Favorite Co. of Canada, Ltd., 418 Main Street East, Hamilton, Ontario. Manufactured by Hamilton Bridge Co., Ltd.



DEMPSTER BALESTER®

DEMPSTER BROTHERS, 8114 Shea Bldg., Knoxville 17, Tenn.

Industries Inc., Michigan City, Ind. Organizers of the new company are John W. Cleveland, Raymond G. Pence and George W. Anselman.

Carpenter Expands Branch

Carpenter Steel Co., Reading, Pa., opened a new branch warehouse and office at 229 Leo St., Dayton, O. It is under the supervision of W. C. Kunkelman, southeastern district manager. R. P. Uhl is branch manager.

Watervliet Tool Changes Hands

Consolidated Metal Products Corp. purchased Watervliet Tool Co. Inc., Albany, N. Y., and will continue to operate it under the same name. New products are expected to be added to the Watervliet line.

Simpson Electric Buys Firm

Simpson Electric Co., Chicago, purchased plant facilities of O. D. Jennings & Co., that city. The building contains over 100,000 sq ft of space and will be used for expanded production of color television test equipment and the firm's new suspension type meter.

Powerking Industries Formed

Powerking Industries was organized by Luke J. Strauss and Peter V. R. Lapey. The firm, which will make rotary snow plows and lawn mowers, leased a building in Tonawanda, N. Y., and plans to build its own plant in about a year.

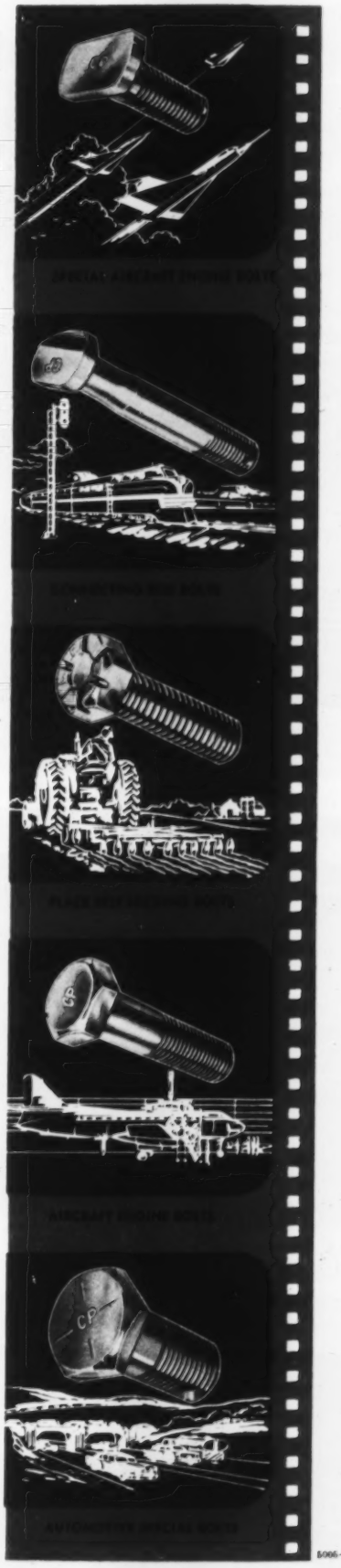
Taussig Associates Organized

L. M. Taussig, formerly metallurgist for Magnaflux Corp., Chicago, formed the firm of Taussig Associates, 1005 W. Belmont Ave., that city. It offers metallurgical consulting and laboratory services, plus chemical, physical and nondestructive testing.

Polymer To Make New Product

Eutectic Welding Alloys Corp., Flushing, N. Y., announces that the metal bonding adhesives formerly manufactured by its Chemo-Tec Division will be manufactured,

(*Please turn to page* 82)



Command performance by Chandler

You have a right to expect "command performance" from every fastener you buy today. Modern automotive engines and aircraft power plants are being put to greater tests. Farm equipment is being designed to accomplish more at greater economies.

It is natural that you expect suppliers to produce finer and higher quality fasteners to meet these increased demands.

That is why CHANDLER specialists are working harder than ever to supply cap screws to closer tolerances to meet your new requirements. Chandler is producing the finest fasteners today in all of its 25 years of experience. Chandler is specializing in mass production of bolts from high alloy steels . . . with special heads or threads . . . with drilled heads or shanks . . . ground to close tolerances . . . and with threads rolled after heat treating.

There is a Chandler cold wrought metal fastener to meet your specifications. It is a fastener of highest quality, uniform accuracy . . . to meet industry's *"command performance"*.

Write today for Bulletin 1264-CH

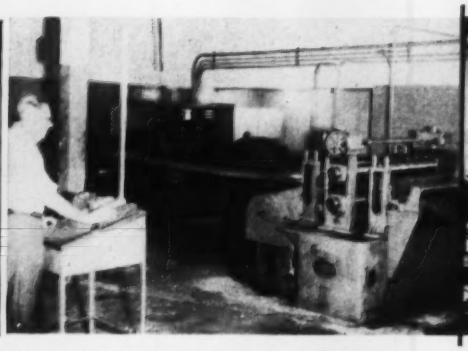
PRODUCTS CORPORATION

1488 CHARDON ROAD
CLEVELAND 17, OHIO

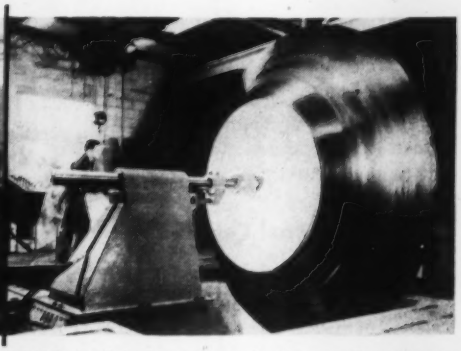
Precise Control of Speeds Means

Better Control of Production Processes

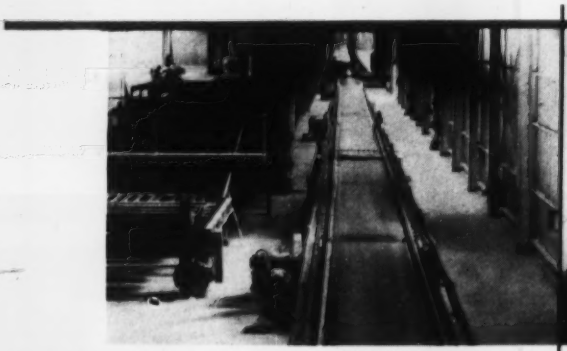
These Applications Are Typical of the Many Possibilities for Cutting Costs and Improving Products



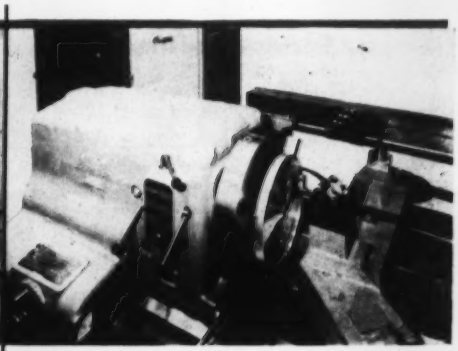
Sheet Steel Slitter . . . Century Selective Speed Finger-Tip control provides a wide range of speeds, including start, stop and threading speed to maintain high tonnage rate.



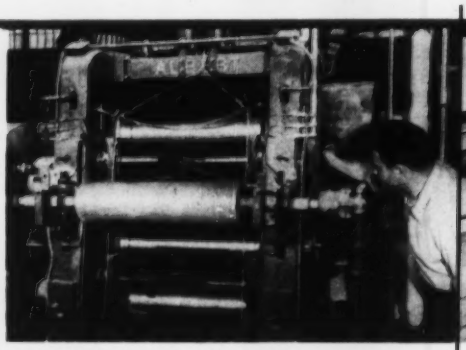
180" Metal Spinning Lathe . . . Performance-Rated speed control allows the operation to be accurately integrated . . . the speed matching the function of shaping.



Plaster Board Processing . . . As thousand-foot sections of plaster board are hardened, speed of each conveyor section is automatically regulated according to the conditon of the material.



Metal-Working "T" Lathe . . . Correct and uniform cutting speed is maintained in this facing operation. Century Selective Speed Drive automatically increases and decreases speed as cycle moves from edge to center and back.



Rubber Calender . . . Century Finger-Tip control allows the processing speed to be constantly regulated in the production of various sizes of rubber thread for the textile industry.

Double-Face Corrugating Machine . . . A production increase of 250% was made possible by the Century Selective Speed Drive on this machine. Speed is accurately controlled for corrugating, gluing, drying, curing, scoring, slitting, and cutting.

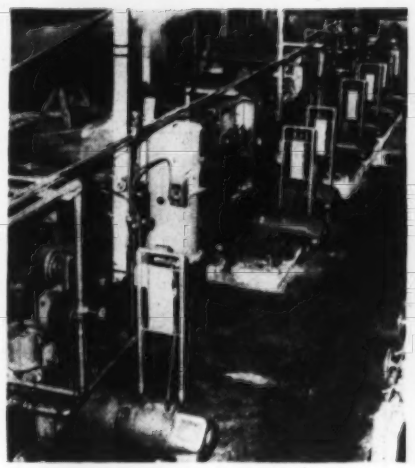
Century C MOTORS

Performance-Rated©

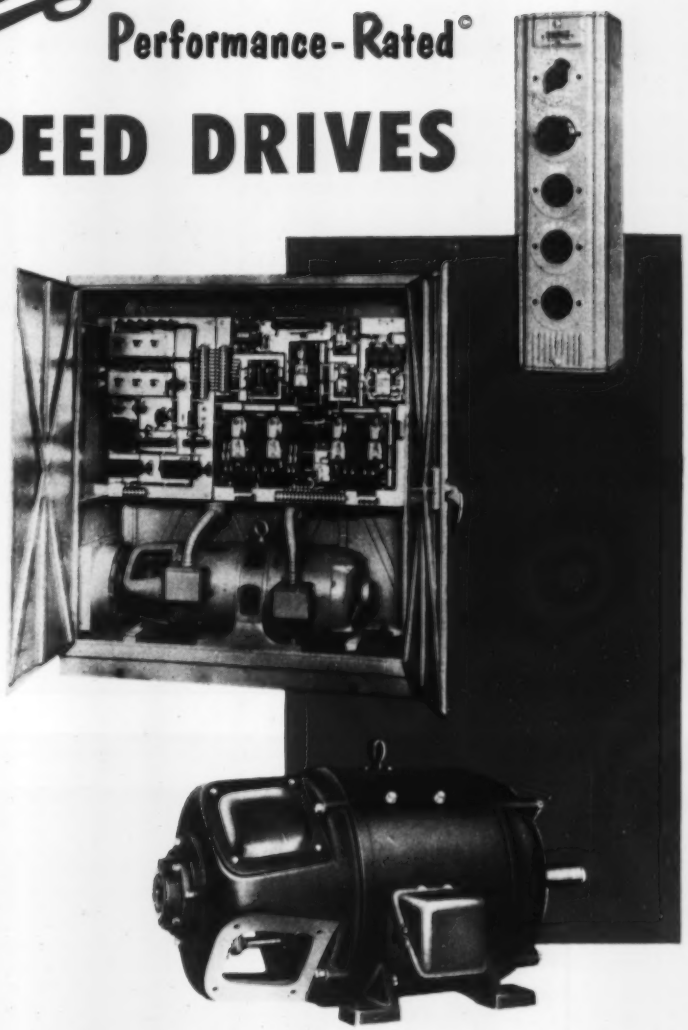
CENTURY ELECTRIC COMPANY

1/8 TO 400 H.P.

with Century Performance-Rated©
SELECTIVE SPEED DRIVES



Textile Pad Dye Steam Range... With a central Century Selective Speed Drive, the several motors on this related sequence operation are accurately controlled.



From 1 to 150 horsepower for operation on A.C.... Wide range of speed with exact control under varying load conditions... Start fast or slow... Forward or reverse... Furnished with or without dynamic braking... Wide variety of remote controls available.

Overhead Conveyor... In this automotive engine test operation, extremely accurate speed control is necessary... and it is provided by a Century Selective Speed Drive.

831

Mail this coupon—find out how Century Performance-Rated Motors and Selective Speed Drives can help you.

TO Century Electric Co., 1806 Pine Street, St. Louis 3, Mo.

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Name ..... *Title* .....

Company .....

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HANDIPILER • LEVEL BELT • LITEWATE • HANDIDRIVE
PNEUMATIC TUBE SYSTEMS

(*Concluded from page 79*)

sold and serviced by the Adhesive Division of Polymer Industries Inc., Springdale, Conn. Eutectic Welding makes a range of special purpose soldering, brazing and welding alloys, electrodes, fluxes and chemical aids.

Reynolds Spring Diversifies

Reynolds Spring Co., Jackson, Mich., acquired the assets, patents and inventory of A. W. Haydon Co., Waterbury, Conn., a division of North American Phillips Co., New York. Reynolds makes direct current timing devices.

Subject to approval of stockholders, Reynolds will sell its cushion spring, mechanical spring and chemical operations to Stubnitz Greene Spring Corp., Adrian, Mich.

NEW ADDRESSES

Alpha Corp., maker of molybdenum disulphide lubricants, moved to larger quarters at 65 Harvard Ave., Stamford, Conn.

California Stamping Co. moved to a new plant at 909 E. 59th St., Los Angeles, to increase production of aircraft exhaust manifold systems.

Boyar-Schultz Corp., maker of dies, tools and screw machine tools, moved to 2000 South 25th Ave., Broadview, Ill.

Addison Clarke & Bro. Inc. announces that its new address is P. O. Box 6336, Baltimore 30.

REPRESENTATIVES

H. I. Thompson Fiber Glass Co., Los Angeles, appointed Kirby Industries, Azusa, Calif., to represent the firm in the general industrial field.

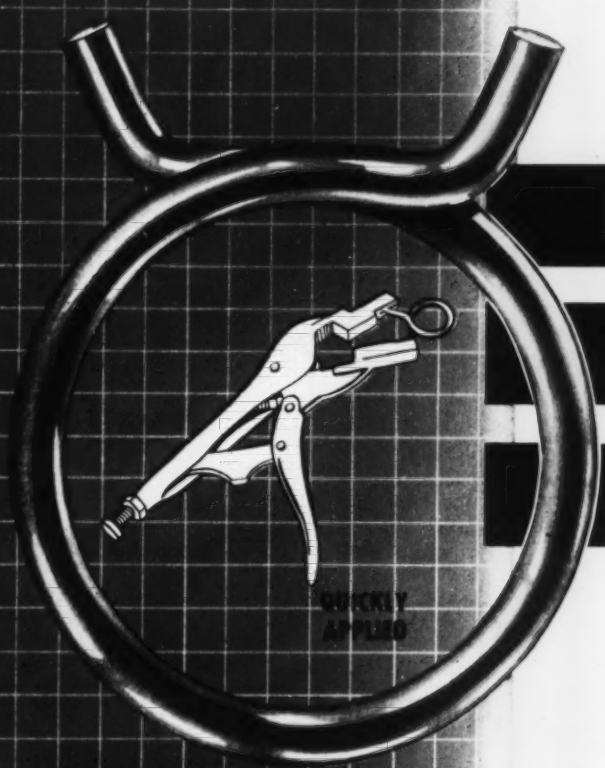
Worthington Corp., Harrison, N. J., maker of machinery, appointed several distributors for its welding positioners and turning rolls: Louisiana Welding Supply Co., Louisiana; Superior Welding Co., Wisconsin; Oxygen Serv-

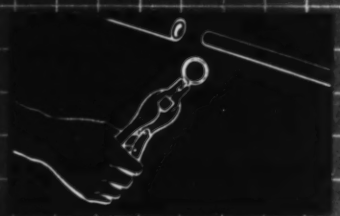
Eaton-Reliance

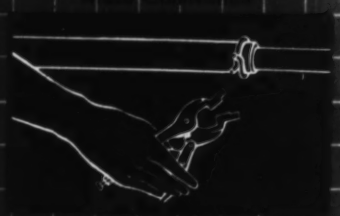
HOZ-FAS-NERS

Simplify Production

Reduce Costs







From time to time on the industrial scene, there appears a new product, which because of its simple design, but revolutionary concept, offers immediate and immense value to engineers and production men. Such is the case of the Eaton Reliance HOZ-FAS-NER. Ideally suited for fastening rubber, plastic or fabric hoses, the Eaton Reliance Hoz-Fas-Ner grips tightly, seals effectively and maintains uniform automatic tension regardless of expansion and contraction of the hose.

The initial cost is low, it is rust resistant and re-usable. No maintenance is required. It will speed production because of its ease of application . . . especially in "hard-to-get-at" places. Let us send you detailed information as found in our Engineering Folder No. 1. Write today . . . no obligation, of course.

RELIANCE DIVISION

EATON MANUFACTURING COMPANY

MASSILLON, OHIO

Springs for Seals | Snap & Retaining Rings | Special Steels | Spring Lock Washers | Hoz-Fas-Ners

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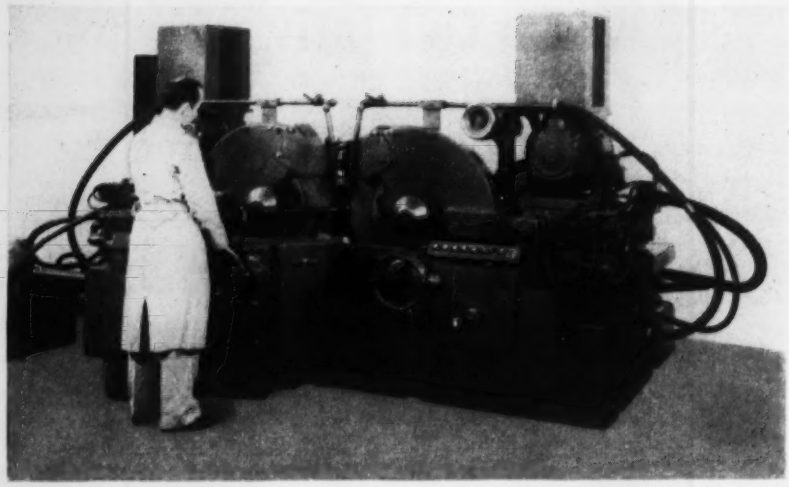
REGISTERED TRADEMARKS OF THE EATON MANUFACTURING COMPANY

(Advertisement)



Automotive Rear Axles are ground almost automatically with Federal Machine Controls on the job. The operator loads axle, snaps on gage, pushes start button. Wheels advance automatically . . . one grinding diameter of bearing and oil seal; the other grinds diameter and flange for brake drum and wheel hub. Federal gages control rate of wheel infeed and cause wheels to back up when work reaches size.

Your Plant Can Afford Automatic Machine Control

New machines are appearing on the market which put production on a wholly automatic basis. There's no doubt about their ability to produce dimensional quality at a better rate than ever before. Such advantages apply not only to machine tools but to any other type of equipment where dimensional accuracy is necessary. In the case of machine tools, considerable savings result in making workpieces correctly the first time. The workpiece is finished directly to required size without interruptions for measurement or other delays. Subsequent check-up inspection is reduced to a minimum.

This same principle applies to machines other than machine tools where the dimensional accuracy of the product is important. Much surplus material can be needlessly given away in an oversize product and much scrap wasted by undersize production.

If your budget does not permit the purchase of new automatic machines, you may be able to secure many of their advantages by applying Federal's standardized automatic control units to your present machines. For example, in the installations shown on this page, see how Federal electrical and electronic gages control machines for large mass-producers. They feed back dimensional information to control feeds and stop operations automatically.

Federal engineers may save time and money for you, too. Automatic machine control is old stuff to them. They've been in it for years. Why not ask for recommendations that will make machine control pay off big in your plant?

FEDERAL PRODUCTS CORPORATION
42111 Eddy Street, Providence 1, R. I.

Ask **FEDERAL**

FOR ANYTHING IN MODERN GAGES...

Dial Indicating, Air, Electric, or electronic — for inspecting, measuring, sorting, or automatically controlling dimensions on machines.

ice Co. and Tennessee Welding Co., Tennessee; Jones Welding Supply Co., Virginia; and Lake Welding Supply Co., Michigan.

Bohn Aluminum & Brass Corp., Detroit, appointed F. H. Langsenkamp Co., Indianapolis, to handle its free cutting brass rod in that area.

Fire Brick Construction Co., West Seneca, N. Y., representative for **J. H. France Refractories Co.,** Snow Shoe, Pa., established warehousing facilities in Gardenville, N. Y.

Morton Bearing Co., Ann Arbor, Mich., appointed William T. Clark of Racine, Wis., as its representative in the Wisconsin area.

Manco Mfg. Co., Bradley, Ill., appointed three distributors for its portable hydraulic tools: Shields Mfg. Co., Cleveland; J. R. Weiss Jr., Cincinnati; and E. M. Nash, Pittsburgh.

ANNIVERSARIES

Continental Screw Co., New Bedford, Mass., is celebrating its 50th anniversary this year. The company is building an addition to its plant to expand the manufacturing space of its affiliate, Hy-Pro Tool Co., by 50 per cent. President of the company is P. Sweeney, who is one of the founders.

ASSOCIATIONS

Dr. John T. Goodwin, formerly with General Electric Co., Schenectady, N. Y., was named manager, Chemistry Research Division, **Midwest Research Institute,** Kansas City, Mo.

Industrial Mineral Fiber Institute Inc., New York, elected the following officers: M. M. Wilson, Baldwin-Hill Co., Trenton, N. J., president and chairman of the board; W. D. Myers Jr., Eagle-Picher Co., Cincinnati, vice president; and J. A. Corcoran Jr., Forty-Eight Insulations Inc., Aurora, Ill., treasurer.

Superior Stainless

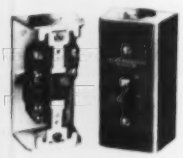
gives them stay-put strength
and greater manufacturing ease

Among many vital needs, the great planes of our worldwide defense system require hose connections that are absolutely safe and sound. Here, stainless steel serves with admirable efficiency resistant to corrosion, tough and strong. • In hose clamp manufacture, SUPERIOR STAINLESS brings extra benefits of exactness in gauge, temper and finish for better workability, finer product performance. *Write us regarding your applications.*

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

ALLEN-BRADLEY QUALITY MOTOR CONTROLS
DEPENDABLE–TROUBLE FREE

FRACTIONAL HP STARTER
With Overload Breaker



Bulletin 600—Overload protection for your small motors.

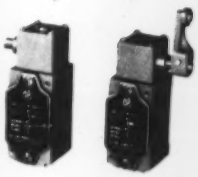
MANUAL STARTER
Across-the-Line Type

Bulletin 609—Most popular hand operated motor starter.

MANUAL STARTER
Watertight Enclosure

Bulletin 609—For installations exposed to moisture conditions.

OILTIGHT
LIMIT SWITCHES



Bulletin 802T—Limit switches with various operating levers.

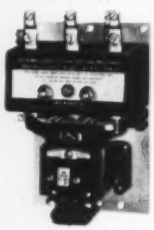
DRUM SWITCHES

Bulletin 353—Drum switches Master—Transfer—Instrument.

SOLENOID RELAY
A-C Universal

Bulletin 700 BX—Changeable from N.O. to N.C. contacts.

SOLENOID CONTACTOR
50 Ampere Rating

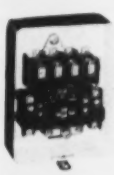


Bulletin 702—Contactors available up to 900 amperes.

PLUGGING SWITCHES
for Quick Stops

Bulletin 808—Zero speed switch for quick motor stoppage.

SOLENOID STARTERS
Sizes 00 to 7, Inclusive

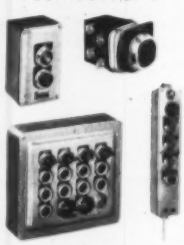


Bulletin 709—Most popular across-the-line motor starter.

CONTROL PANELS
for Sequence Control

Typical Allen-Bradley panel for machine tool control.

PUSH BUTTONS



Bulletin 800-800T—Over 800 styles and types of controls.

A-C SOLENOIDS

Bulletin 860—A-C Solenoids 9 sizes—25 & 60 cycles.

A-B Quality

● Here are starters, contactors, relays, and pilot controls for all types of motorized machines and equipment. These controls . . . and many more are listed in the latest Allen-Bradley Handy Catalog.

The heart of the Allen-Bradley line is the time-tested, constantly improved Allen-Bradley solenoid starter. It has maintenance free, double break, silver alloy contacts. Its simple one piece solenoid mechanism is trouble free. For quality motor controls, recommend, specify, and install Allen-Bradley controls.

Allen-Bradley Co., 1320 S. Second St., Milwaukee 4, Wis.

Simplicity—The Key to the Leadership Position of Allen-Bradley Starters

Solenoid Starter

Reliable Solenoid Motion | Simple Design Only One Moving Part | Enclosed Arc Hood a Compact Unit | Reliable Overload Relays | Maintenance Free Contacts

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

STEEL

November 8, 1954

Technical Outlook

MICRO MOUNTAINS— A professor of physics at the University of London has developed a "topographic" microscope which makes surface features of metal finishes stand out like mountains. A fine line scratched on a piece of glass in the scope casts a shadow which shows up features as fine as 0.00001 in. in relief. The microscope has already been used to study bearing surfaces.

ELECTRIC MOTH BALLS— Cathodic protection is being given the mothball fleet harbored at Wilmington, N. C. Electrodes submerged in the riverbank mud and connected to on-shore rectifiers set up a circuit which prevents ship-bottom corrosion. Cost of the method is about one-fifth that of other forms of protection says General Electric. The government expects to save nearly $1500 a year per ship with the installation.

PROBLEM OIL— Cold rollers, worried over a shortage of strategic palm oil during an emergency, can relax. Tallows, readily available from meat packing concerns, can be processed into a satisfactory economical substitute, says John P. Sheehan, metallurgist at Illinois Institute of Technology.

VACUUM AVAILABLE— Want a special alloy vacuum melted to your specifications? Carboloy Department of G.E. is offering job vacuum melting service. Furnaces ranging in capacity from 10 to 1000 lb will be ready at Detroit in early 1955.

BRITTLENESS, GOODBYE— A heat treatment which prevents brittleness in a titanium alloy developed at Battelle Memorial Institute has a good chance of working with other titanium alloys. After initial heating and quenching, aging reheat must be at or above 800 F for controlled periods. By varying aging treatment above 800 F a wide range of strength and ductility combinations can be obtained. Battelle's alloy contains 3 per cent Mn, 1 per cent each of Fe, Cr, V and Mo, balance titanium. It has been heat treated to strengths of over 200,000 psi.

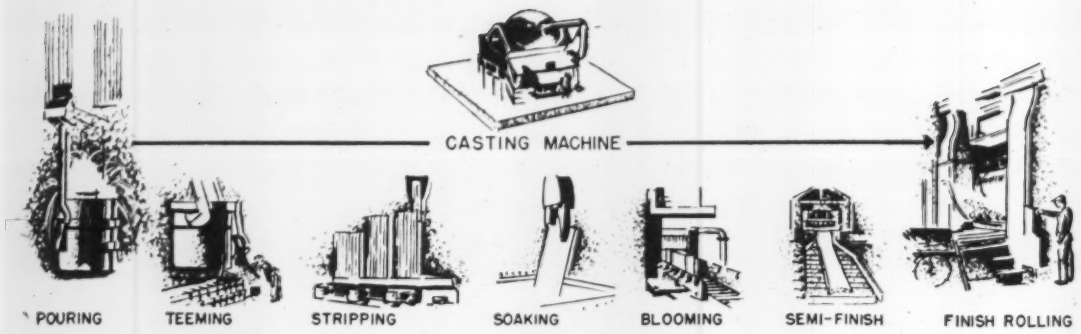
CYLINDER WEAR— Chrome plating the walls of its aircraft engine cylinders has already saved $15-million in replacement costs the Navy figures. The thin layer of chromium extends the service life of engine cylinders from 1200 to over 3000 hours, cuts corrosion of cylinder bores, reduces piston ring wear 50 per cent and reduces oil consumption and accumulation of carbon and sludge in oil systems.

DEFYING ZINC— Molten zinc quickly corrodes most metals, a situation which promotes a constant search for zinc-resistant coatings. Three Battelle Memorial Institute investigators have tried another tactic—powder forming of zinc-resistant parts. They report that sintered chromium borides containing cobalt showed no attack by molten zinc and have high resistance to oxidation.

SELF-FOOTED CRUCIBLES— Carbon - bonded silicon carbide crucibles should be used with pedestal blocks of the same material is the advice of Electro Refractories & Abrasives Corp., Buffalo. The company points out that such blocks have the same coefficient of expansion, which minimizes strains, and will not soften, spall or slump at normal furnace temperatures.

CONDUCTOR— A new aluminum alloy for electrical bus conductor, combining high strength and high conductivity, is available from Kaiser. Tensile strength of 29,000 psi, yield strength of 25,000 psi and conductivity of 55 per cent (international annealed copper standard) are minimum characteristics. It's made in many shapes and can be easily plated and welded.

Metalworking Outlook—p. 37 Market Outlook—p. 141



Fewer Steps To Finished Steel

Steelmen are waiting for cost data on the first commercial caster. If they're favorable, a dream will have become a reality. Odds are with the optimists

By THOMAS F. HRUBY
Associate Editor

NOT too long ago, mention of the continuous casting process in steelmaking circles brought forth profuse scoffing and head shaking. Now, even the professional skeptics are climbing on the bandwagon.

Watching slabs, billets and bars slide off the cooling bed of the casting machine at Atlas Steels Ltd., Welland, Ontario, (see story on p. 100) has fired the imagination of every steelman who has visited this commercial installation—it's the first on this side of the Atlantic.

Here's Why—Picture an integrated steel plant without ingot teeming and stripping areas, no soaking pits, no blooming mill. Also subtract mold and stool preparation, ingot handling cranes and buggies and all the maintenance and handling labor involved. At its best, continuous casting bypasses these operations—and with a capital expenditure within the reach of even the small operator.

The casting machine at Atlas, for instance, cost in the neighborhood of $1 million. It has a capacity of 30 to 40 tons per hour, and only five or six men are required to operate it. Electric furnaces feed this particular installation, but there's no reason why the pouring ladles couldn't be filled from open hearths or even the new oxygen converters.

No Revolution—It's too easy to project a development of this kind into the future, capsuling time until the normal evolution begins to look like a revolution. The people who ought to know, say there won't be a revolution in steelmaking technology. John F. Black who heads up the Koppers Co. group which built and installed the casting machine at Atlas sees it this way:

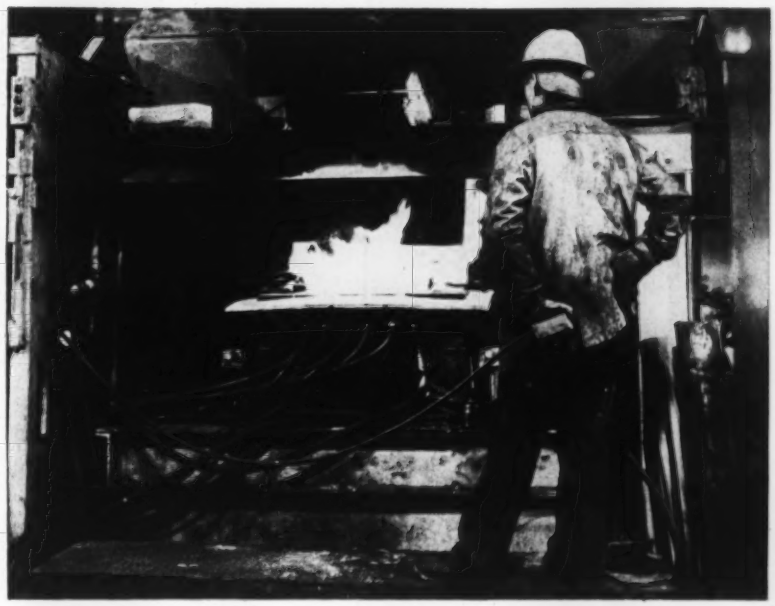
"Right now, continuous casting offers some appealing advantages to the producers of tool, stainless and alloy steels — exceptional yields, good surface and sound structure. And, to the operator whose aging soaking pits and blooming mill are keeping him behind his competition, continuous casting can be a life preserver," he believes.

But Mr. Black thinks it is extremely unlikely that there will be a wholesale switch from blooming mills to continuous casting.

Seconded—The fact that the ingot-breakdown equipment in the industry represents such a gigantic capital investment is insurance against large scale changeover. But this isn't expected to keep the big integrated mills out of the continuous casting picture.

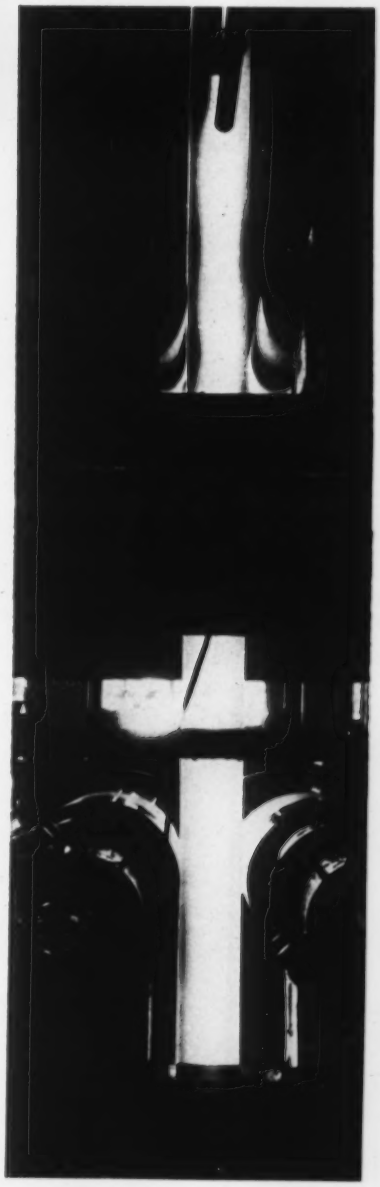
From Beaver Falls, Pa., where Babcock & Wilcox and Republic Steel have been jointly researching the process with their own casting unit, comes this comment: "Continuous casting has a place in large integrated mills today, but mostly for the making of stainless or other high-value steel products. But it is a proces well worth considering when contemplating a new plant, even for low-carbon steel."

Bright Outlook—Of the several individuals doing the most to further the process in the U. S., consultant Norman Goss of Cleveland is perhaps the most outspoken in his appraisal of the future of continuous casting. Holder of some basic patents of his own, Goss sees new interest being



Operating men will have to acquire new know-how since techniques and equipment are so radically different

Where the steelman is used to the horizontal flow of material, he will have to adjust to vertical operation



focused on small integrated mills for specific market areas.

"Projected studies indicate that teaming continuous casting with electric or oxygen steelmaking can make profitable the operation of an integrated mill of no more than 50,000 tons per year," he points out. Using conventional equipment and techniques, it is generally conceded that 300,000 tons is the minimum figure for profitable operation of ingot breakdown equipment.

What Now?—Getting back to the realities of today, the next several months will be a period of watchful waiting. The ice has been broken at Atlas. The only other commercial installation is at Barrows, England. It, by the way, is amazing the steel world with its production of better than 450 ipm of 2-in. carbon steel bars.

How critical is the difference between pilot plant and commercial operation? Allegheny-Ludlum's vice president and technical director, W. B. Pierce, put it this way: "Our pilot plant established the feasibility of the process, but we look to the Atlas production unit to establish the economics."

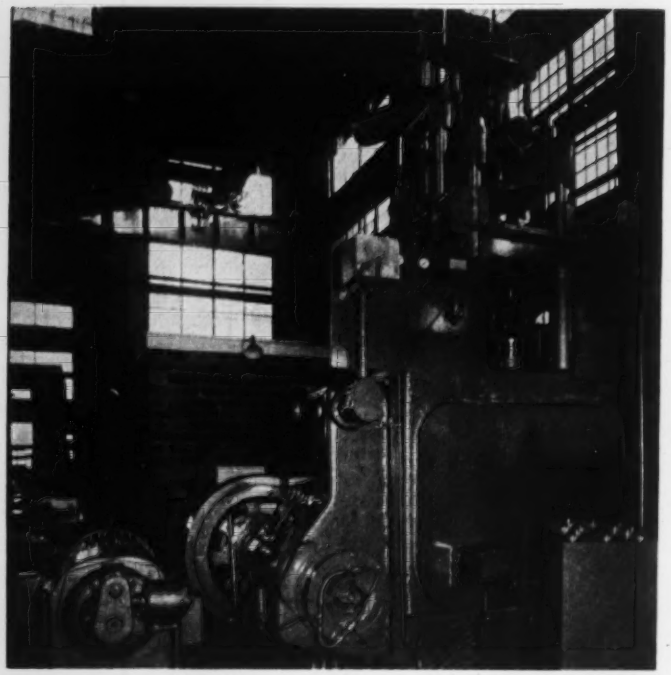
Many of the details of the machine at Atlas were worked out at Allegheny's Watervliet, N. Y., works where the company's pilot machine has been in operation several years. Valuable know-how has been shared with the Koppers Co. team which built the Atlas machine.

The Equation—Steelmen have been dreaming of continuous casting since Bessemer's days a hundred years ago. But though the idea was there, the technology eluded researchers until the 1930's. Oddly enough, when the process did arrive commercially, it was the nonferrous industry that first reaped the benefits. But for the efforts of a scant few who proved that steel could also be cast in this fashion, the two commercial installations of today would still be years away.

Big question now is: What kind of an answer will come out of the equation when commercial factors are used? The process isn't the cheapest way to cast steel. Output is slow in relation to manhours.

Will the apparent advantages prove to be commercially more weighty than the disadvantages? The people who drew the process out of its pilot stage are confident they will. If they're right, we're witnessing the planting of a major milestone in the steel era.

See p. 100 for detailed story on Atlas Steel's operation of continuous casting



This 100-ton compacting press embodies the requirements suggested by users. In operation, control pulpit is at die level

By BYRON B. BELDEN
Hydraulic Press and Power Tool Division
Baldwin-Lima-Hamilton Corp.
Baldwin, Pa.

Presses themselves hold back full utilization of the process, B-L-H believes. Adapted equipment has too many limitations, which means that the . . .

Pressure's On The Press Builders

METAL POWDER pressing has come a long way in a relatively few years, but it has barely started to realize its growth potential in the metalworking industry.

Material suppliers have been developing new powders and improving old ones. Manufacturers of sintering furnaces have improved atmosphere and temperature control features. The companies who compact metal powders have displayed great ingenuity in making complex parts. But all were beginning to bump up against a progress barrier . . . press limitations.

The industry was faced with a major problem. Most presses were adaptations of those used to compact pharmaceuticals, plastics and so on.

One Approach—Our approach was to talk to companies using presses to gain first hand knowledge of what was required.

Presses that were adapted to the compacting of metal powder parts had numerous disadavantages and limitations. Operating mechanisms were not properly protected, allowing the abrasive powders to cause undue wear, which, in turn, caused poor die and punch alignment and excessive maintenance. Setup was often lengthy, because it was necessary to change cams to get correct relative movement of the punches and die. In many cases it was possible for the press timing to be affected by the deflection in the levers or moving parts of the press.

We also found, in survey and in laboratory tests, that the ejection capacity of any new press must be considerably greater than that previously offered.

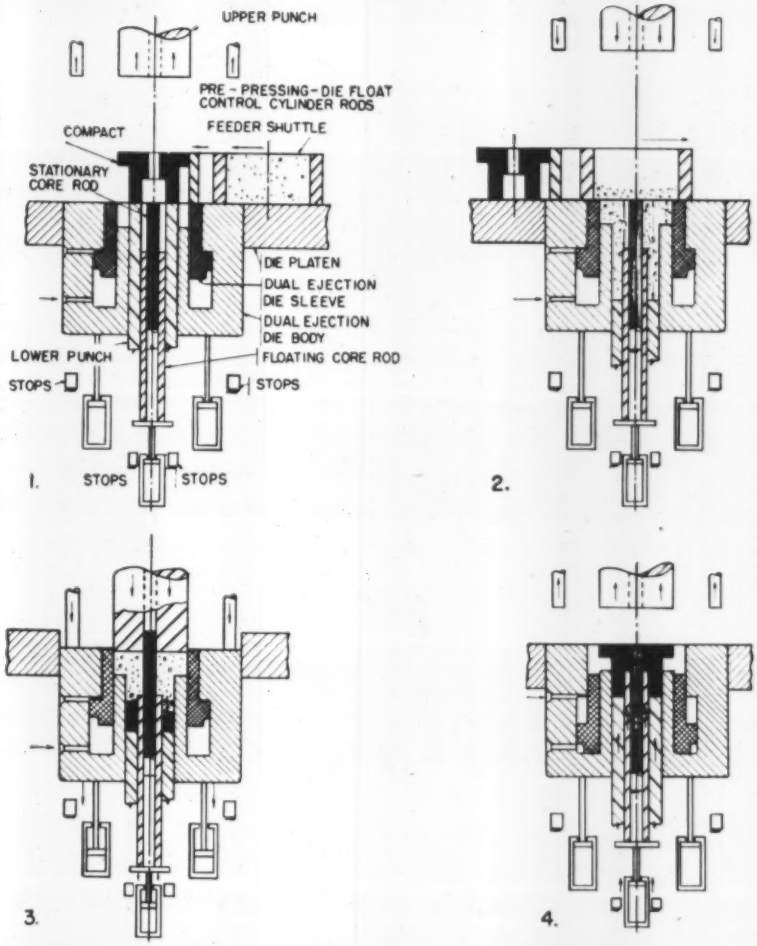
Setting the Design—With these things in mind, it was decided to concentrate on a four-column, crank type press. Though this type has a higher initial cost, its many advantages, plus simpler die sets, more than offset the price differential.

This design provides rigid guiding for the top and bottom punches, as well as for the floating die and floating core rod. Center of the press is kept clear so that the core rod mechanism can be mounted directly on the centerline of the press.

Hydraulic Head — The head mounted on the four columns is a hydraulic cylinder in which there is a piston in direct contact with the upper ram or top punch support. An adjusting mechanism allows the relative position of the top punch to the stroke of the head to be adjusted. Pressure in the head is obtained by charging the accumulator above it with air or nitrogen.

Ordinarily, it is difficult on a mechanical press to know exactly what pressure is going to be obtained during any given cycle. Use of the hydraulic or floating head makes it possible to predetermine what pressure will be applied. Also, a slight dwell of pressure is obtained by adjusting the top punch. A floating action takes place during the pressing part of the cycle.

Floating Die—Reason for using



Drawings show various stages in pressing cycle for flanged part with a counterbored hole. Note stationary core rod directly in center. No. 2 shows floating core rod returned to fill position before feed shuttle returns. No. 3 illustrates that pressing commences in the bottom section of the part first and is completed when top punch enters the die. No. 4 shows bottom punch pushing part out of the die while core rod moves with it

a floating die rather than top and bottom punch motion is that, in the case of flanged parts, the top punch is not limited to the compacting of the flanged section of the part. The entire upper portion of the press housing does not float; instead, we've provided a separate alloy steel casting called a die holder.

The die holder is rigidly guided over the same vertical members used to guide the bottom punch support. Use of the floating die also enabled introduction of what is called "pre-pressing die control." It is possible to control flange thickness and density with a displacing powder in the die before pressing or compacting of the part takes place.

Tests show it is possible to obtain uniform density throughout the part without any so-called pressure cracks in the area of the part directly under the flange.

Automatic Lubrication—Use of the four-column design permits complete enclosure of the operating mechanism of the press. It also provides for adequate dust seals to prevent abrasive material from getting into the bearings, etc. Crankshafts are drilled so that oil under pressure can be pumped to the connecting rod bearings and others which are subject to load. A pressure switch insures that the press cannot be operated unless there is oil pressure in the lubricating system.

Adjustment Indicators—Direct-reading indicators are calibrated to read in increments of 0.001 in. for the depth of fill, top punch position, die float stop, core rod stop and ejection stroke. There is no guess work in setting up tools to make a part.

The ejection mechanism was designed so that there are no cams to change, and there is no lost motion at any time between the cam and the bottom punch supports. The part being ejected is not subjected to an impact load.

Dual Ejection—To get around the problem of timing two or more cams to operate two punches simultaneously, a die sleeve that can be retracted to clear the OD of a flange before the bottom punch starts to move was designed. This die sleeve is operated hydraulically and controlled by a cam in such a manner that it is impossible for the motion to get out of time. Timing never need be changed either.

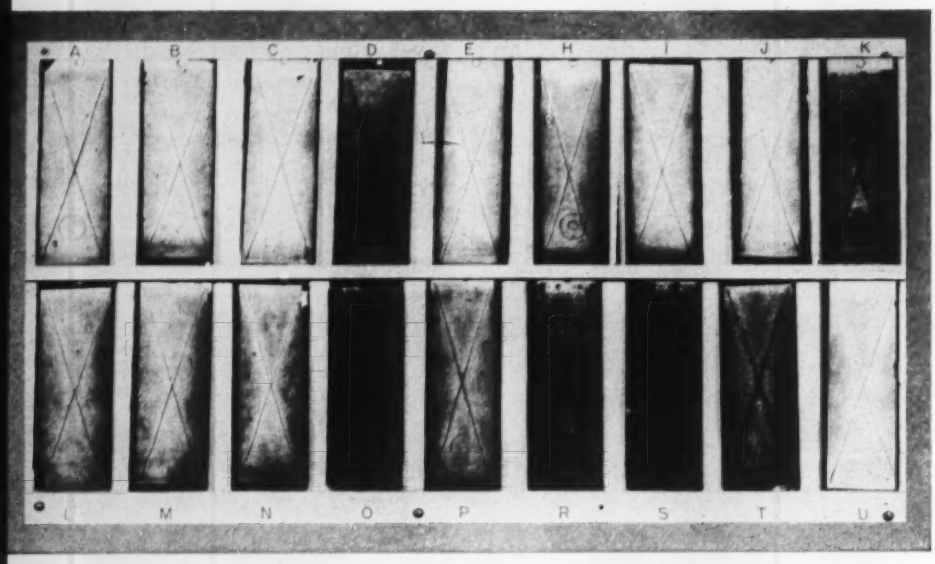
Floating Core Rod—Core rod can float down when friction is generated between the material being compacted and the sides of the core rod. It is also possible, when making counterbored parts, to control the rate of speed at which the core rod will move. The material over the core rod does not have to be compacted to move the core rod down.

The core rod is free to move with the part during the ejection part of the cycle, too. This reduces ejection pressure required and makes it easier to control lengths.

Cycling—Presses may be cycled as follows:

1. Continuous run.
2. Semi-continuous run with dwell —they'll stop at any predetermined point, dwell and start automatically. Dwell time is adjustable.
3. Single stroke—they'll stop at any predetermined point, re-start only when operator pushes "start" button.
4. A combination of steps 2 and 3—single stroke and dwell in the same cycle.
5. Inching.

We feel this equipment, which is in production in 50 and 100-ton sizes, has bridged a gap. Continued research and testing will undoubtedly make possible the use of metal powders for parts once considered impossible.



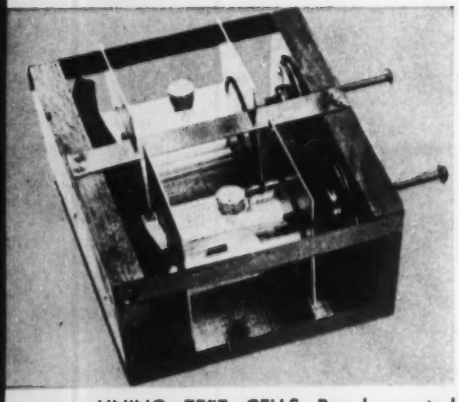
ENAMELED TEST PANELS—Effect of tight scale on test panels with one mil of white enamel exposed outdoors at Columbus, Ohio, for 18 months is shown by condition of hot-rolled steel panels D, K, O, R, S. Panels A through K were given zinc phosphate treatments. L and M were descaled with phosphoric acid type treatments. N through R were given iron phosphate treatments. S was alkali-cleaned hot-rolled steel, T was alkali-cleaned cold-rolled steel, and U was coated with a wash primer

COATED CONTAINERS—

You Can Get More Into Them

When steel shipping container manufacturers wanted to broaden the usefulness of their products they turned to research

By L. J. NOWACKI
Assistant Chief, Organic Coatings Research
Battelle Memorial Institute
Columbus, Ohio



LINING TEST CELLS—Panels coated with container linings are held in place at each end of glass cells used to evaluate resistance of linings to hard-to-package products. Each cell is about half filled with the liquid product so that the lining is exposed to liquid, air or vapor above the liquid and liquid-vapor interface

FINEST QUALITY CONTAINERS at lowest possible cost: That's the goal of a continuous program bringing results in the steel shipping container industry.

Steel containers have been reliable packages for a variety of materials for many years. But their manufacturers are always on the lookout to expand their usefulness. One advance they've made is the lined steel container for materials that could not be packaged in steel—the product was contaminated by the iron or the container was corroded by the product.

Research Brings Results — Container manufacturers have developed lined containers with excellent properties through work in their plants and a research program at Battelle Memorial Institute, sponsored by the Steel Shipping Container Institute Inc. (SSCI). Many plants have installed phosphating lines to provide a better base for painting and give a cleaner interior in unlined containers. Some plants have speeded production on 55-gallon drum lines to nearly 600 drums per hour.

Research sponsored by the SSCI is directed primarily toward the development of better organic coatings for lining steel containers. Considerable work has also been done on metal cleaning and surface treatments.

Inside Story—Organic linings for steel containers are coatings that combine: 1. Excellent resistance to the wide variety of products that may be packaged in steel containers. 2. A high degree of resistance to mechanical abuse, and, 3. A cost low enough for single-

trip containers. These conditions are being met by a group of epoxy-phenolic-type linings (Synthetasine linings) developed at Battelle.

Synthetasine Protective Coatings, Inc., has licensed five companies to manufacture the coatings: Bradley and Vrooman Co.; Glidden Co.; Interchemical Corp., Finishes Division, Pittsburgh Plate Glass Co.; and Stoner Mudge Inc.

They Can Take It—These linings combine resistance to chemicals and mechanical abuse. With many "hard-to-package" products, they equal or better the resistance of pure phenolic linings.

Synthetasine 100, first of the linings, is a white coating that turns cream colored when baked.

(*Continued on p.* 114)

EIGHT ANSWERS TO PHOSPHATE COATING PROBLEMS

Container manufacturers asked Battelle these questions about phosphate treatments:

(1) What is the best weight of the zinc phosphate-type coating for container interiors and exteriors?

If the drum manufacturer wants a high degree of resistance to reverse impact for his linings, or wants to paint the flat sheet and then form the container, he will keep down the weight of the phosphate-coating. For the best salt-spray resistance (required by Government specifications), somewhat heavier castings seem to be necessary (400 to 500 mg/ft^2). Some compromise with salt-spray requirements may be necessary if the same phosphate treatment is to be used for both the interior and the exterior of the steel container, or if forming operations follow the painting.

(2) How does the iron phosphate-type coating compare with the zinc-iron phosphate type?

In laboratory tests the best pretreatments of the iron phosphate type were comparable to the best zinc phosphate types on an over-all basis. In reverse-impact and ductility tests they were better than the zinc-phosphate coatings.

(3) How does the phosphate-type scale remover compare with the metal-phosphate treatments?

The phosphate-type scale remover was comparatively poor in salt-spray and humidity tests. Otherwise, it compared rather favorably with the metal-phosphate treatments. It appears to hold considerable value as a simple treatment for hot-rolled steel.

(4) What are the comparative performances of the phosphate coatings on ordinary and descaled hot-rolled steel?

There is little doubt that scale removal is necessary before phosphating. Phosphate coatings on ordinary hot-rolled steel (with scale) were of little or no value for improving outdoor-exposure performances. Improved outdoor durability is probably the most important reason for using phosphate treatment. On the other hand, performance was considerably improved by any type of pretreatment that removed the scale.

(5) What is the effect of the chromic acid rinse?

It was necessary for best performance in the salt-spray and water-immersion tests but seemed to make little difference in outdoor-exposure results.

(6) How effective are the phosphate coatings for inhibiting corrosion in unlined containers until they are filled?

With few exceptions, there was less rust on metal-phosphated panels exposed to high humidity than on clean cold-rolled or hot-rolled steel. They were generally effective in decreasing the rate of corrosion on steel.

As-received steel rusted considerably less than the cleaned steel, probably because it was protected by an oil or grease film. Rusting on most of the phosphate-treated panels was about comparable to rusting on the uncleaned steel.

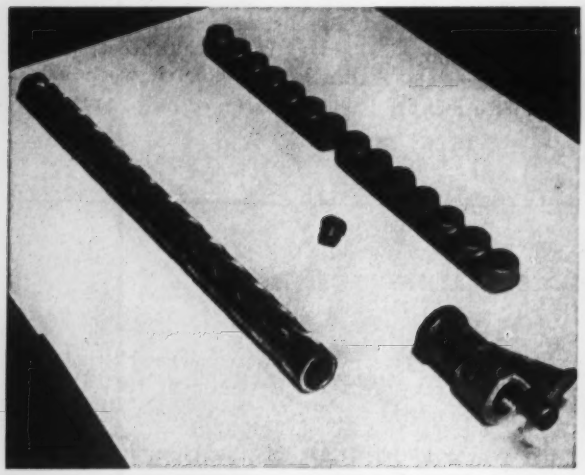
When the interiors of phosphated drums were fogged with protective oil they were effectively protected against rusting during storage.

(7) How do the phosphate coatings affect the reverse-impact resistance of container linings?

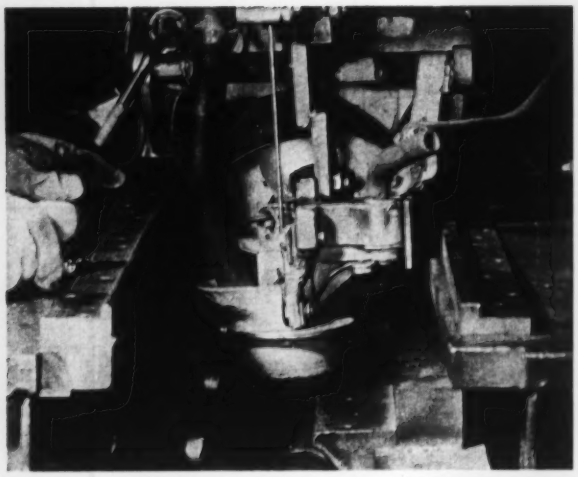
Heavy zinc phosphate coatings impair the reverse-impact resistance of organic linings applied over them. It is difficult to establish a definite maximum coating weight that will be satisfactory, although something like 200 mg/ft^2 would seem to be satisfactory. Considerably lower weights of phosphate coating would be necessary to withstand forming operations.

(8) How do the phosphate coatings affect the resistance of container linings to chemicals?

Considerably more information is needed before this question can be answered. But it appears that the effect of the phosphate coating is specific with each hard-to-package product.



These components—the three simple steel forgings at right, the wrought steel tube at left—are arc welded economically into a sturdy one-piece structure



Unionmelt head, traversed along track, completes one of its two longitudinal submerged arc welds that join castings to tube. Welds are made at a rate of 60 ipm

Tidy Fabricator for Tough Assemblies

This difficult assembly is fabricated readily by joining dissimilar elements. Use of filler wire at longitudinal joints helps keep flux out of wrought steel tube

ARC WELDING often is an answer to fabricating assemblies difficult to produce economically by other means. A good example is the horizontal spindle for cotton picker drums made by International Harvester Co.

In the Harvester picker, cotton is picked by horizontal spindles that project radially from a vertical steel tube. The entire assembly rotates about a vertical axis at the same time each of the 14 spindles is rotated about its own axis.

Casting Assembly—Each spindle requires a bearing in a boss. To provide the 14 bosses, two steel castings must be fastened to one side of the tube. They follow this method because difficulties in making a properly-cored, one-piece steel casting that includes both tube and bosses would be prohibitive.

A cast steel fitting also is required at one end of the tube, which has a 3/16-in. wall pierced with 14 holes. When the assembly is made by arc welding, holes in the steel tube must be placed in line with the casting bosses.

Parts are assembled in a manually-operated indexing fixture. They use an arc weld tack to fasten the end casting to the end of the tube. The two steel castings also must be tack welded on both sides. Next, the welded assembly is placed in a special fixture to be welded by a Unionmelt machine.

Procedure—The assembly must be oil-tight and rigid when completed, so it's necessary to make 22 in. longitudinal welds along the two sides of the castings. Each machine has a track for advancing the head at 60 ipm.

To submerge the arcs, a granular flux is fed automatically from a hand-filled hopper, which is part of the head. Each machine is supplied from a 600-amp generator and uses 5/32-in. wire. Before welding, 3/32-in. filler wire is laid along the joint by hand. This keeps the granular flux from falling inside the tube, also avoids possible burnthrough. Filler wire is fused completely as the weld is made.

Flux Collection—When the weld is completed, the operator indexes the fixture 180 degrees to bring the assembly into position for the second longitudinal weld. In making the shift, flux not fused during completed weld drops into a trough.

Fused flux that adheres to the weld is knocked off over a screen on which large particles are collected and discarded. Most small particles that pass the screen are unfused. They're mixed with unfused flux that collects in the trough below the fixture. At intervals flux in the trough is screened and re-used.

It Gets Results—With this setup, one man operates the machine to make two longitudinal welds on about 34 weldments an hour. Welds are uniform and afford excellent penetration.

Completion of longitudinal welds does not finish the welding work. But remaining welds all are short and can be made quickly by hand —one at each of the outer ends of the two side castings and one to complete the joint where the two castings meet.

Look into
REVERE EXTRUDED SHAPES
—it may pay you as it did Westinghouse

When engineers of the Westinghouse Electric Corporation, East Pittsburgh, Pa., designed an inner-cooled generator rotor, the problem of making the hollow rotor coils arose. It was decided to make these out of two channel sections, butted together. Such channels could be made by milling solid copper bar, but Westinghouse knew how expensive such a process is. Could Revere produce the channels by the extrusion process? We thought we could, and after close collaboration with Westinghouse engineers, the various design and extrusion requirements were finalized. The channels are extruded, drawn, annealed, and then given a final draw.

Generators containing these special rotors are cooled by forcing hydrogen through the inner-cooled conductors at 30 psig. Because the heat is picked up directly from the copper, cooling performance is greatly increased over former designs. As a result, generator output can be approximately doubled without increasing physical size. To put it in other ways, output is increased per pound of generator weight and per pound of fuel.

Extruded shapes can save a great deal of machining time and money, and make new ideas commercially practical. Come to Revere for them in copper and its alloys and aluminum alloys.

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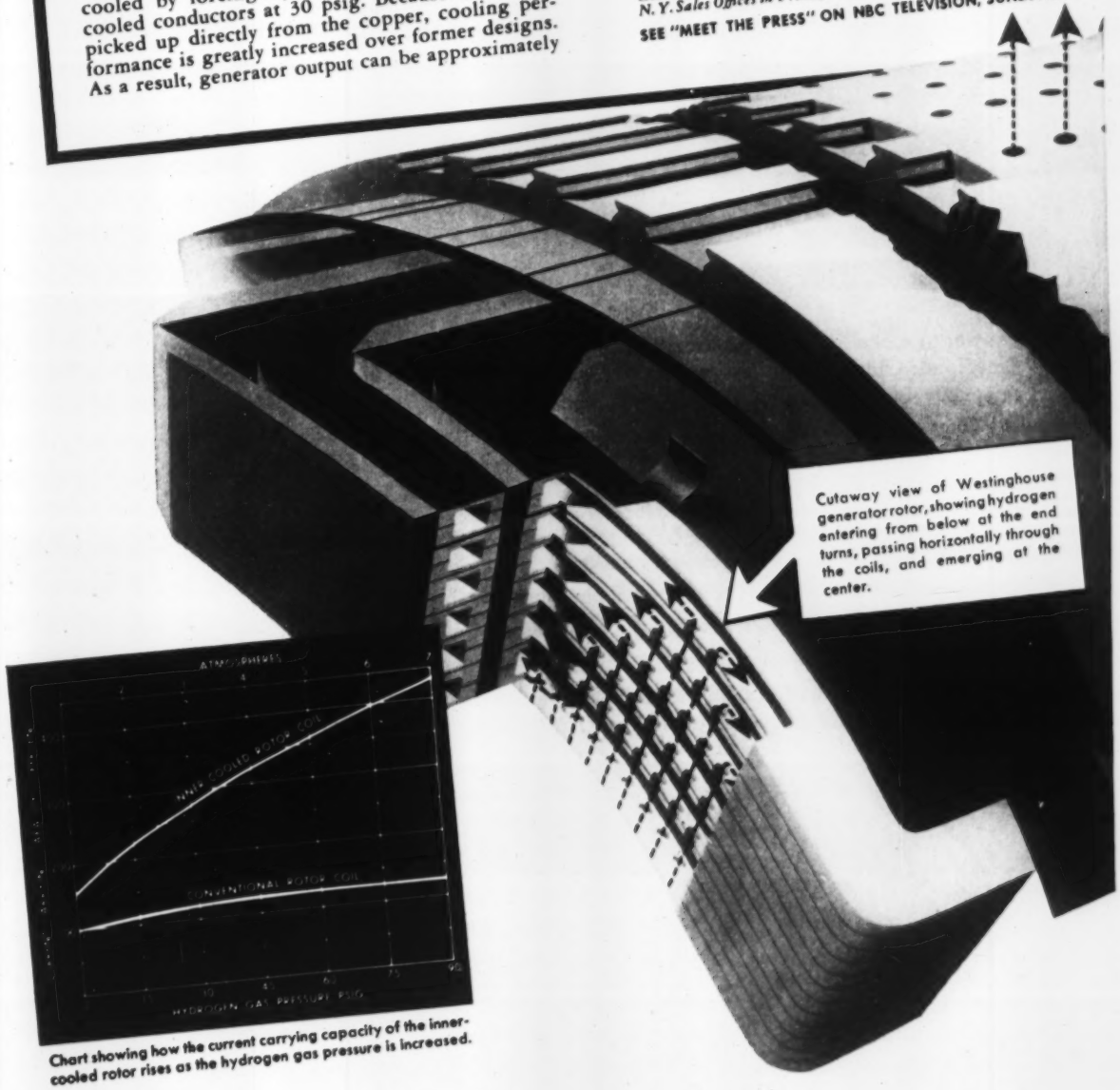
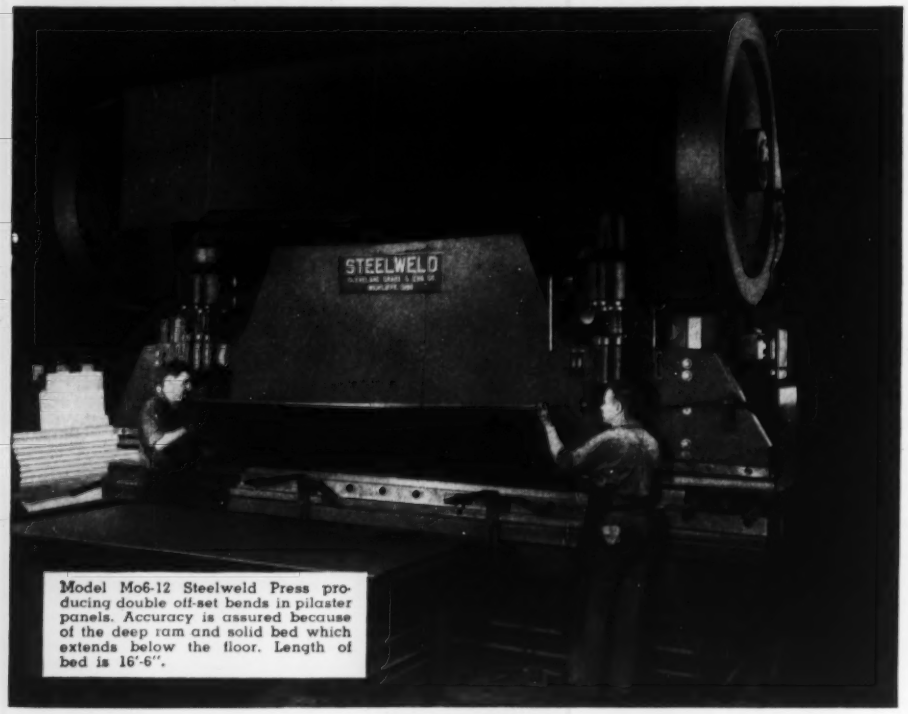


Cutaway view of Westinghouse generator rotor, showing hydrogen entering from below at the end turns, passing horizontally through the coils, and emerging at the center.

Chart showing how the current carrying capacity of the inner-cooled rotor rises as the hydrogen gas pressure is increased.

Special Press features

SPEED PRODUCTION



Model Mo6-12 Steelweld Press producing double off-set bends in pilaster panels. Accuracy is assured because of the deep ram and solid bed which extends below the floor. Length of bed is 16'-6".

It takes power to make long sharp bends. It takes size and design to assure accuracy. The Mills Company, Cleveland, Ohio, well-known manufacturers of fine metal partitions achieve both with their big 500 ton capacity Steelweld Press.

But more! They also obtain speed and safety. Their machine is provided with several features that are extremely advantageous:

1. Air-electric control for high production.
2. Electric foot switches for easy fatigueless operation.
3. Ram-positioning selector for stopping ram automatically at pre-selected points.
4. Two speeds, 7 or 21 strokes per minute for best operating speed.
5. Reversing flywheel for quick stopping or reversing of ram at any point.
6. Safety dual control permitting operation only when both operators are ready.

The Mills Company are proud of their modern Steelweld Press. It is the largest of several press brakes in their plant. It is in continuous operation, two shifts a day.

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Production orders are duplicated by Auto-Stat. Order set is made up of six cards routed by Schedule Control

Hourly pickup service is provided by in-plant messenger on motor scooter; speeds routing of processed order forms

Simplified Control Speeds Jet Production

Photocopies of production and material record forms convey data on status from department to department. Manual copying and verbal contact methods eliminated

TO SPEED the production of jet fighters, North American Aviation has decentralized shop production control, fixing responsibility on individual departments.

Under the old system, shop personnel transmitted information to departments by word of mouth and manual copying. Departments slated to receive parts had to backcheck their status.

Work Cycle—Now, the basic flow of work starts with the planning department. Here, information received from engineering is translated into instructions for production departments. As far as practicable, each airplane project is established as an independent group. The planning department becomes a single point of contact for other departments.

Flow of work is from this planning group, through order preparation to a schedule control center, which routes copies of the orders to the proper destinations. Production orders collect materials and tools for the work to be performed by production departments. With ample information flowing from the top down, the need for backchecking is lessened.

Heart of the System—Twenty-three photographic copying machines have trimmed paper work associated with production orders. These machines, Apeco Auto-Stats, are in some 20 departments throughout the Los Angeles and Downey (Calif.) plants. American Photocopy Equipment Co. supplied the continuous copiers and automatic processing machines, which are combined into one compact unit.

Production and material record forms are processed on the machines as they travel through the production flow. All necessary information (part or assembly, quantity, description, production status and authorized changes) is recorded. Photocopies are used for behind schedule notifications, split orders and tooling orders.

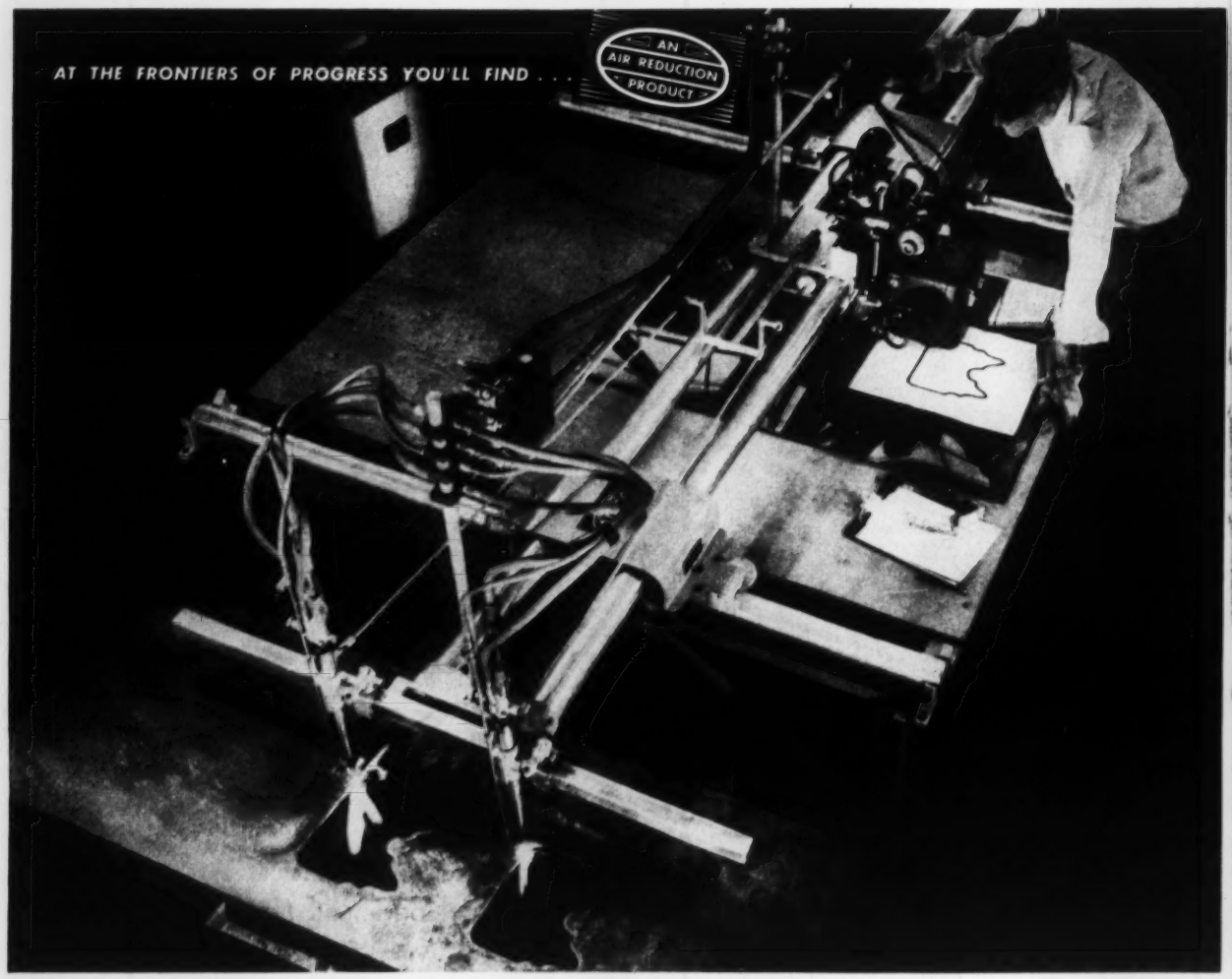
Changes are easily made. Sections no longer of interest or that are no longer current are simply blanked off.

Each copy duplicated is in positive form. The copying unit is small, requiring less than 2 sq ft of working space. No dark room is necessary.

Hourly messenger pick-up service insures fast delivery of the forms to their destinations within the manufacturing departments.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .

AN AIR REDUCTION PRODUCT



The Airco #48 Duograph cutting machine equipped with Electronic tracer. Note simple, sturdy construction and centralized control station. Basic tracing area 48" x 51". Cuts four 4-foot circles at once. Additional tracing table increases length to 131".

▲ **CLEAN, SHARP-EDGE CUTS.** No scale or slag to remove. Duograph cuts so closely only a light grind or finishing operation is required.

Sound engineering and design give the Airco #48 Duograph the precision to produce close-tolerance parts as accurately as heavier, higher priced pantograph-type machines — Airco's Oxygraph or Travograph, for instance. For ease of operation, everything rolls — nothing slides. Sealed, precision ball bearings never need lubrication. Guide rails are cadmium-plated for resistance to corrosion.

Ask your Airco Representative for illustrated booklet containing complete details and specifications . . . or, if you prefer, write to the address below.

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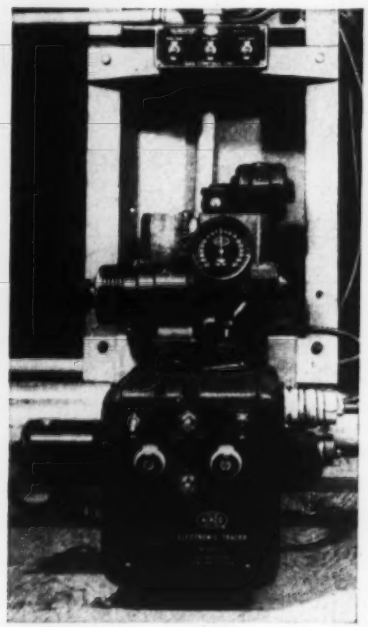
Introduced at the 1954 Metal Show

The NEW AIRCO #48 DUOGRAPH

the first rectilinear shape cutting machine that gives you the accuracy you want . . . at a price you can afford



▲ **CHOICE OF 3 TRACERS.** Use the sure, accurate Airco Electronic Tracer, the magnetic tracer, or manual tracer, according to type of work. Tracer equipment is interchangeable.

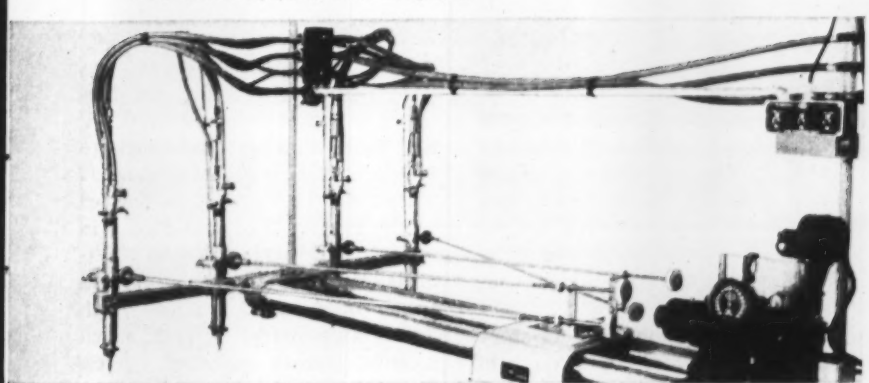
$3450*

featuring:

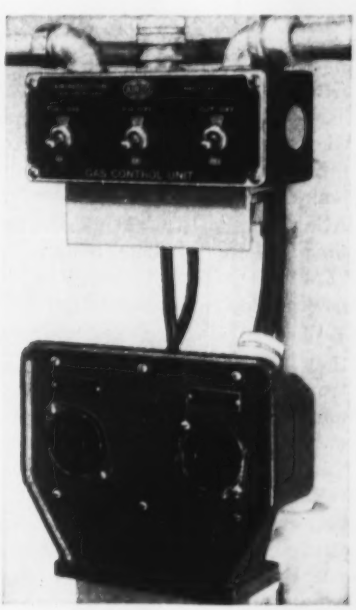
- **48" x 51" cutting area (one table)**
- **up to 4-torch operation**
- **centralized controls**
- **gas-saving solenoid valves**
- **accurate cuts**

***Includes:** Complete machine with 2 torches • ten Airco #45 high speed cutting tips • manual tracer • solenoid controlled gas distribution system • straight edge • radius rod • hose supports • tracing table • hose to torches

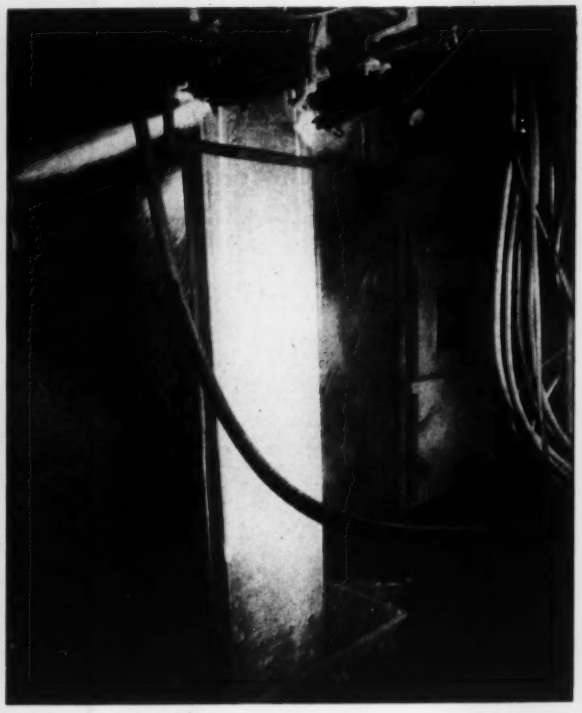
Other equipment available: Airco Electronic Tracer • Airco Magnetic Tracer • 2 additional torches • additional tracing table



▲ **MOUNTS UP TO 4 TORCHES.** Torches clamp on mounting bar as illustrated. Easily positioned — 2 at left, 2 at right.



SOLENOID OPERATION — CENTRALIZED CONTROLS. Solenoid valve control saves gas. All controls grouped in central operation position — saves steps, speeds work. ▶



Metal being cast moves down through chill and pinch roll levels to the oxygen cutoff level below. In 10 to 15 minutes it goes from ladle to cut-to-length, semi-finished product, bypassing ingot and blooming stages

Pioneering A New Era In Steelmaking

They aren't claiming any honors, but Atlas Steel may be operating the "mill of tomorrow." Continuous casting and planetary hot mill show the way to shortcuts

INNOVATIONS always mean headaches to the production man who has to nurse the machine or process through its first trying hours. Imagine what it's like at Atlas Steels Ltd., Welland, Ontario, where a whole handful of "firsts" are being worked into a new concept of steelmaking!

When the bugs are removed they'll be taking slabs of stainless from the first commercial continuous casting machine, heating them to rolling temperature in 10 minutes in a special furnace, then rolling them down to 0.062 in. (if necessary) in a single pass. And that's just part of the equipment purchased in the company's latest expansion.

Two Goals—Atlas wants to: 1. Help supply the Canadian market with all the stainless it can consume. 2. Step up efficiency in tool and specialty steel production. Continuous casting, with its inherent low scrap losses and process shortcutting, is an understandable management gamble.

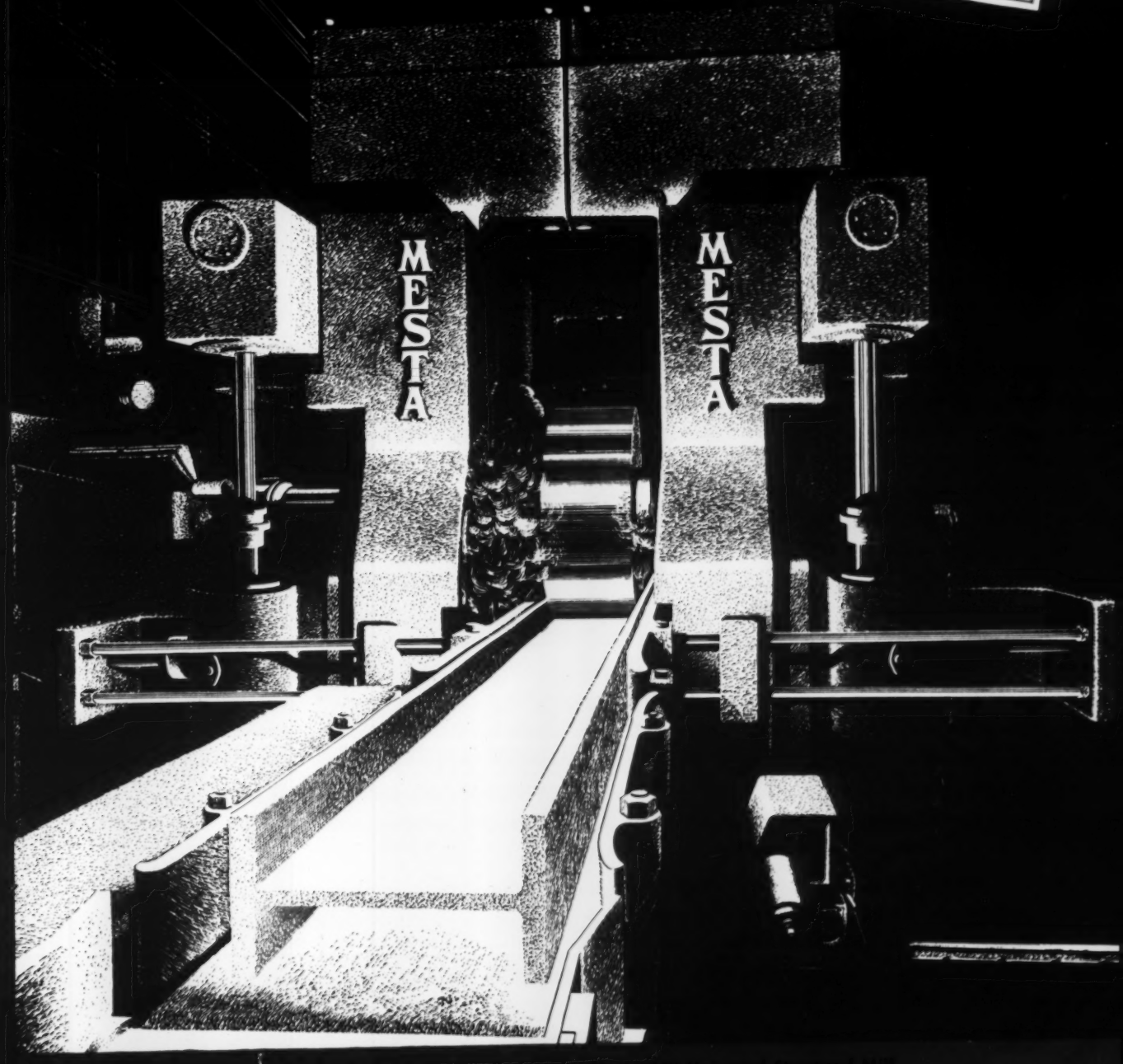
Koppers Co. built the four-story high machine under patents held by Continuous Metalcast Co. The process itself is not new, having become quite basic to nonferrous metal production; but this is the first commercial installation for steel production in North America. The only other one is casting carbon bars in England.

How It Works—Molten metal from one of Atlas' six arc furnaces is poured into a special 35-ton ladle that is preheated to 2400°F. After a patented cover is placed on the ladle, it is hoisted to the casting floor and placed in an automatic tilting cradle. Metal is poured in a steady stream from ladle to the tundish which serves as a funnel through which a quiet stream of metal travels into the copper mold.

In starting up the process, the mold bottom is sealed by a starting bar, which is threaded through machine. After about 20 seconds of pouring, the starting bar is slowly withdrawn by the pinch rolls, and the half-molten slab begins its descent. The water-

UNIVERSAL STRUCTURAL MILL

Designed and Built by
MESTA



Vertical Forging Rolls will be added to the 40" Universal Structural Mill to be installed at the Indiana Harbor Works of Inland Steel Company.

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY • PITTSBURGH, PA.

cooled copper mold has an oscillating motion, traveling downward with the slab for a distance of ¾ in. at the speed of the slab, then rapidly returning to its starting position.

The continuous cycle improves slab surface and aids rapid chilling of the metal. Reducing gas atmosphere is maintained where molten metal could come in contact with the atmosphere. Vegetable oil sprayed continuously on the inner perimeter of the mold lubricates it.

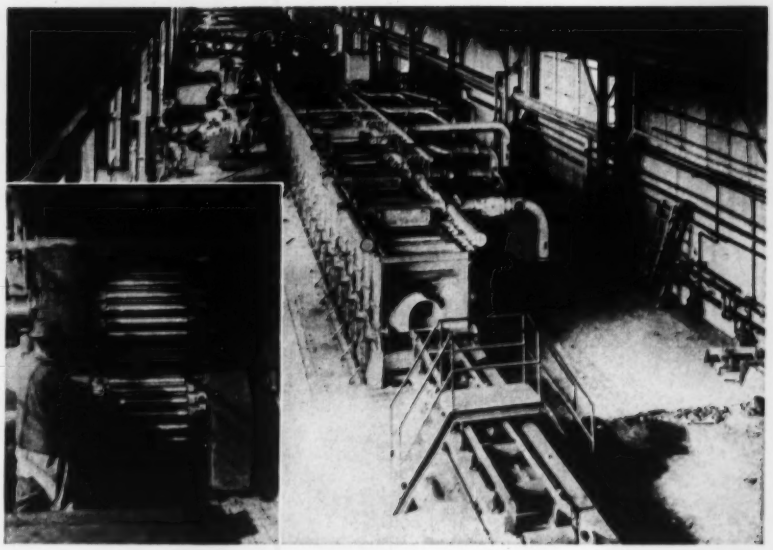
Cooling Sections—Second level contains a suspended cooling box whose sides are a series of small rolls between which powerful jets of cooling water are sprayed on the descending slab. From tundish to the bottom of the cooling rolls it's about 15 ft; in that distance the slab is cooled 1000°F.

The third level contains pinch rolls synchronized to the mold speed. They direct the slab to the bottom level or cutting chamber. Here two oxygen cutting torches automatically clamp to the descending slab and cut it as the cutting rig moves downward. Pieces are then lowered into the carrier pit for the trip back to ground level. Now cooled down to about 1500°F, the cut-to-length slabs are ready for finishing.

Product Split — Ultimately, stainless and tool steels will part company at this point in production. Tool steel billets will go to soaking pits or forge furnaces, then to the blooming mill or hot forge. Stainless slabs, cast to rolling size, will move directly to the hot mill. For the time being, Atlas is taking 5½ x 21½-in. slabs through a couple of passes on the bloomer. Surface is then conditioned with a continuous oxygen-iron powder descarfer, another innovation in the stainless business.

Atlas is ordering a mold to produce 2¼-in. slabs directly, and with these they will bypass soaking pit, bloomer, descarfer and shot blaster. The excellent, fine grained chill surface of the continuous-cast slab will then be preserved for the hot mill.

Hot Planetary Mill — Equally significant to the rest of the steel industry is the installation of the 24-in. Sendzimer hot mill. In essence, this is a four-high mill, having 27-in. backup rolls and 3⅝-in. work rolls. Work rolls, however, are positioned (48 for each backup roll) around the periphery of each backup, much like a series of rolling pins.



Part Two of Atlas' new setup is this 24-in. hot Sendzimir mill. Slabs 16 ft long and 2¼ in. thick are heated to rolling temperatures in 10 minutes and rolled to gate in one pass. Closeup shows planetary arrangement of rolls

Since work rolls themselves are not driven, two sets of feed rolls are mounted ahead of the planetary stand and in the same housing. They push the slab through and also insure that succeeding slabs are tightly butted against the one being rolled. Unlike conventional mills that operate with a time lapse between slabs, optimum procedure with this mill is continuous operation. Reason: Every time it's started up, the leading end of first slab must be pinch-rolled for entry into the planetary stand.

The Cycle—With continuous operation the goal, all equipment in the hot mill is designed accordingly. Slabs 2¼ to 3 in. thick and up to 20 in. wide by 8 to 32 ft long are stacked on a slab depiler to a depth of 21 in. A special pusher peels them off the top individually, either to the pinch rolls or directly to the furnace entry table. The depiler automatically lifts the stack after each slab is removed, so that next one is at entry table height.

Slabs move down the 42-ft entry table, timed to the speed of travel inside the furnace. Heating capacity of the continuous, high head furnace is 25 tons an hour. Designed and built by R. S. Products, the furnace is 70 ft long and has 40 burners firing from each side. One side is directed above and the other below work level. A cyclonic heat flow is created around the slab, heating a 16-ft length in 10 minutes. Three sets of water-cooled side guides in the last two sections of the furnace center the slab before it leaves.

Unconventional—Planetary rolling of hot strip is a radical departure from the conventional. With leading and trailing ends of succeeding slabs butted together, they are slightly reduced in the feed rolls and pushed into the planetary stand at about 6 fpm. The heavy bite taken on the slab as each set of work rolls strike it creates a rapid staccato noise. With about 95 per cent reduction in one pass, exit speed of the strip is in the neighborhood of 100 fpm.

The beating action of the rolls actually puts transverse roll marks in the strip. Immediately behind the planetary stand is a two-high finishing mill, which imparts a smooth and accurate finish. Run-out table is 78 ft long to the conventional upcoiler at the far end.

Cold Finishing—While not new to the industry, the continuous

(*Continued on p. 116*)

H-P-M FASTRAVERSE
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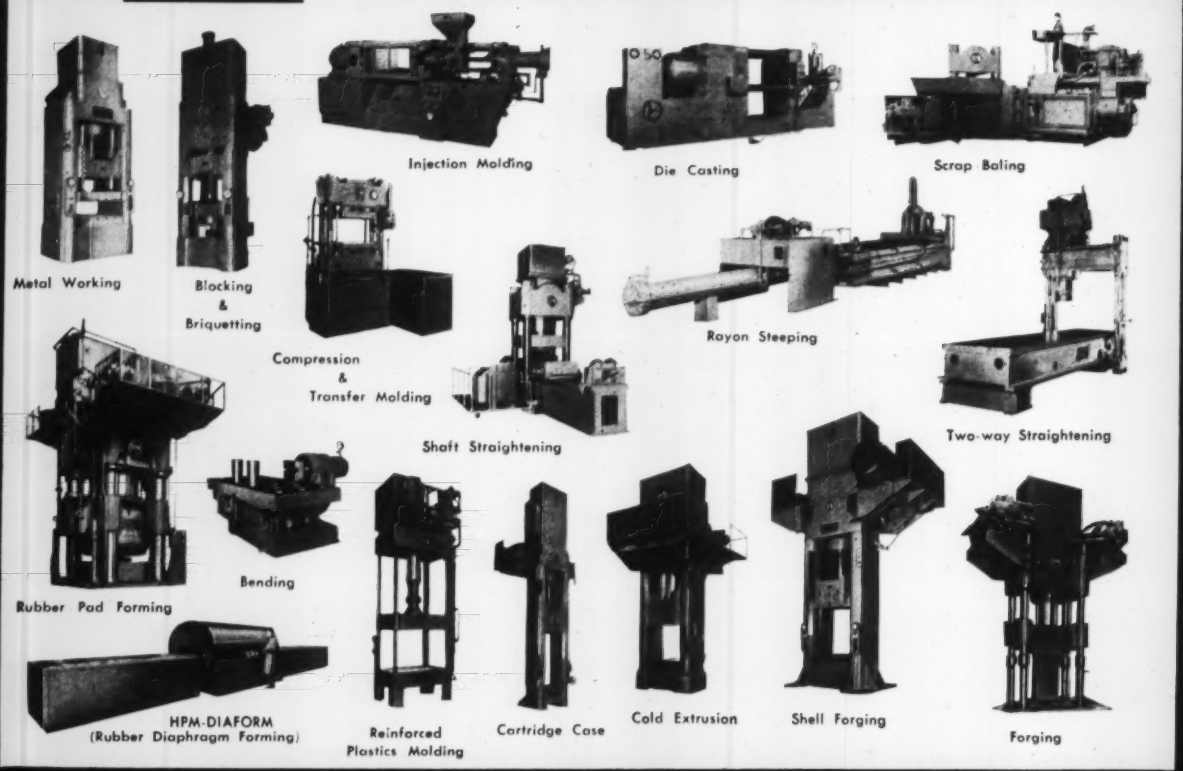

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TABLE OF TEMPERATURE LIMITS

With One Color-Change

Thermocolor No.	Original Color	Changed Color	Color-Change Temperature °C	°F
1	pink	blue	40	104
2	light green	blue	60	140
2a	pink	violet-blue	80	176
2b	pink	lilac	95	203
3	yellow	violet	110	230
4	purple	blue	140	284
4a	blue	black	165	329
5	white	brown	175	347
6	green	brown	220	428
7	yellow	red-brown	290	554
8	white	brown	340	644
9	green	white	440	824
11	red-orange	yellow	560	1040
12	light green	black	640	1184
13	yellow	black	710	1310
14	yellow	black	900	1652
15	white	black	1000	1832

With Two Color-Changes

20	light pink	light blue	65	149
	light blue	light brown	145	293
21	grey-green	olive-green	145	293
	olive-green	brown	220	428
22	blue-green	yellow-brown	190	374
	yellow-brown	black	330	626
23	blue	yellow-brown	240	464
	yellow-brown	black	340	644
24	yellow	violet	290	554
	violet	brown	340	644
25	pink	lilac	55	131
	lilac	blue	85	185

With Three Color-Changes

Thermocolor No.	Original Color	Changed Color	Color-Change Temperature °C	°F
	grey-green	light blue	65	149
30	light blue	olive-green	145	293
	olive-green	brown	220	428
	brown	grey-blue	145	293
31	grey-blue	light brown	230	446
	light brown	red-brown	275	527
	pink	yellow	145	293
32	yellow	grey	175	347
	grey	olive-green	340	644
	yellow	black	175	347
33	black	violet	290	554
	violet	brown	340	644
	yellow	orange	420 recedes	788
34	orange	grey	700 recedes	1292
	grey	brown	820 does not recede	1508

With Four Color-Changes

	pink	light blue	65	149
40	light blue	yellow	145	293
	yellow	black	175	347
	black	olive-green	340	644
	light green	light blue	65	149
41	light blue	yellow	145	293
	yellow	black	220	428
	black	brown	340	644

Tell-Tale Colors Make Temperature Visible

IT'S no secret that the color of certain substances is related closely to their temperatures. In fact, several techniques have been devised to apply the reaction to fast, instrumentless measurement.

Most important drawback of many chemical systems is that colors change back after cooling. While they can warn of excessive heat in visible locations, they can't record temperature of an inaccessible part.

But you can get color paints and pencils that offer permanent recording. They're marketed under the trade names, Thermocolor and Thermochrom. Responsible for the development is the German firm Badische Anilin-und Soda-Fabrik. It's marketed in the U. S. by Bryson Oil Co.

The Reaction—The substances are metallic salts that liberate water, carbon dioxide or ammonia at certain temperatures and change color in the process. Extensive possibilities are apparent from the fact that some of the compositions change color more than once—and at distinct temperatures. For example, from pink to light blue, from light blue to yellow, from yellow to black and from black to olive-green over the 150 to 650 F range.

Accuracy is excellent, too. Compositions make desired color change within 10°F., satisfactory on most jobs.

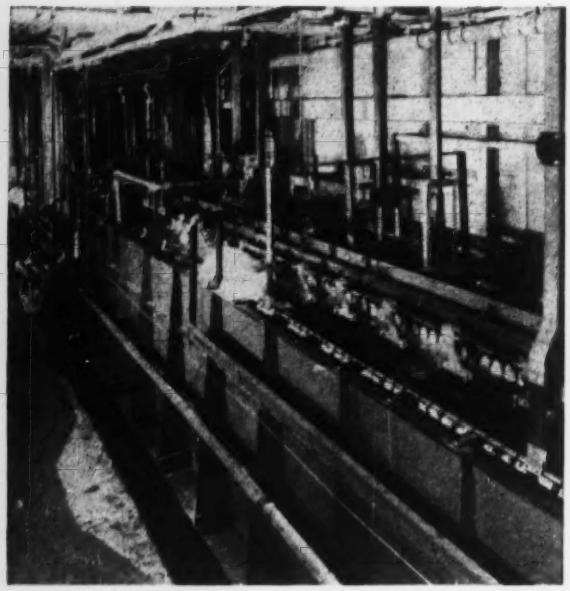
Two Approaches — Actually, there are two practical approaches to use of the so-called tell-tale colors. Application of each is controlled by degree of accuracy required in the temperature measurement.

On a project, such as surveying the temperature of an aircraft structure surrounding a hot gas turbine, Thermocolor accuracy is satisfactory. Strength of the affected structural members barely changes within a 20 F spread. Even where a much higher degree of accuracy is required and thermocouples are used, the color method can be applied first to detect the most suitable location for the couples.

Process Controls—Simple application and excellent accuracy suggest a variety of uses. For example, parts undergoing heat treatment must have even temperature distribution. Painting a portion of the load in the oven offers a simple check on heat conditions.

To prove out uniformity of temperature and heat distribution in design and arrangement of shell mold pattern heater elements, the technique has also been applied successfully. The entire surface is coated and an instantly reversible brand of color used to check changes up or down.

Plating Line Goes Pushbutton



Auto parts march through nickel plating tank

ANOTHER PLATER has gone automatic.

Industrial Stamping & Mfg. Co., division of Vinco Corp., Detroit, used to plate copper, nickel and chrome on auto parts by hand, but recently the job was taken over by a Udylite 24-station automatic return type plating machine.

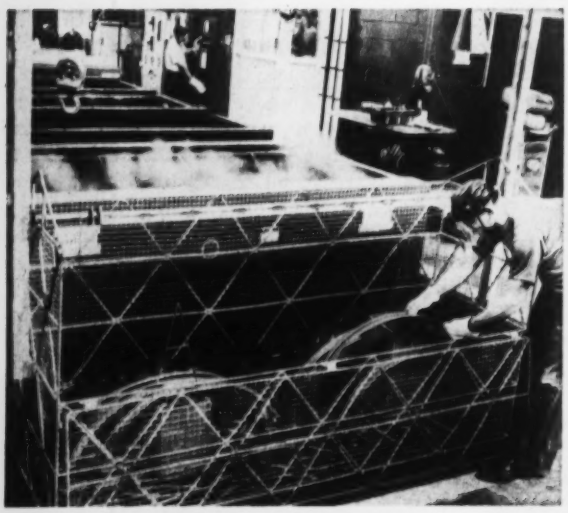
Out-of-the-ordinary are regulating features built into the installation which handles 50 racks an hour based on a 55 minute nickel plate. For example, one push button controls the five selenium rectifiers that provide the nickel plating amperage.

Just Right—The machine operator sets the control rheostat for the desired amount of nickel plating voltage; and regardless of how much work is in the tank, the voltage is automatically adjusted to remain constant. Proper voltage for the specified plating thickness is assured.

Each rack of work goes into the chrome plate "live" carrying about 3 v. As the racks reach the bottom of the down stroke, a strike voltage of 9-18 v is automatically applied and then automatically drops to the plating voltage after a few seconds.

A simple cam arrangement permits halving the nickel cycle without changing the cleaning cycle.

Descaler Gets the Jump on Tomorrow



Titanium parts go into basket for descaling

TITANIUM BY THE TON tomorrow is the forecast of crystal ball thinkers at Bell Aircraft Corp., Buffalo. They came up with a production descaling line to be ready.

Bell does some work with titanium now. Scale created by heating the metal has to be removed before forming, so the line isn't standing idle.

Caustic Dip—Descaling medium is sodium hydroxide at 720 F. Parts are immersed in the caustic bath 5 to 10 minutes, then moved to a cold water spray tank. Traces of scale surviving the first two tanks are removed by a nitric-hydrofluoric acid dip. Cold water dip followed by a hot water dip to speed drying completes the process.

Once parts to be descaled are loaded in a basket the sequence is remotely controlled by one man from an enclosed booth. Descaling chemicals can be changed if others prove more effective or economical. Built-in capacity for the future can be seen in the basket size: 10 x 3 x 4½ ft.

IT'S HIGH-GRADE ORE NOW

New process makes pelletizing and heat-hardening of taconite concentrate practical

THESE hard, relatively uniform-size pellets, containing 60% to 65% iron, were produced from taconite in the first full-size (1000-plus tons per day) plant of its kind.

The new plant, designed by Arthur G. McKee & Company was built after a long period of experimental development and pilot-plant operation in which McKee engineers collaborated to perfect the process. A large-scale plant to produce 12,000 tons a day is now on McKee drawing boards.

Pellets produced by the new method withstand the rigors of shipping, handling and charging into the blast furnace. They provide an ideal burden which permits uniform flow of gases throughout the furnace. Accurate control of physical and metallurgical properties of the pellets is easily maintained and production is more efficient and more economical than by any other method of processing taconite concentrate.

We will be glad to supply you with complete information on the new process at your request.

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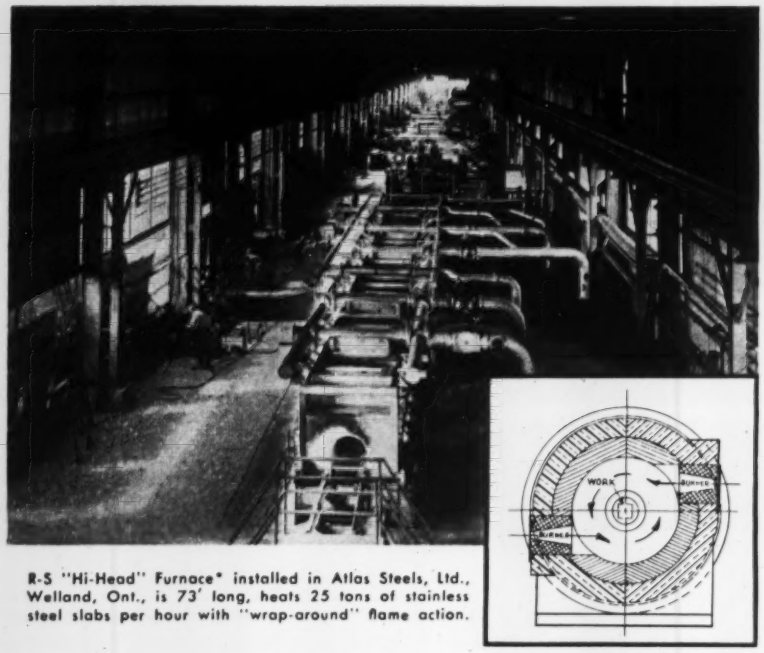
R-S HI-HEAD FURNACE HEATS STEEL SLABS



R-S "Hi-Head" Furnace* installed in Atlas Steels, Ltd., Welland, Ont., is 73' long, heats 25 tons of stainless steel slabs per hour with "wrap-around" flame action.

"Wrap-around" flame action

HEATS 25 TONS OF STAINLESS PER HOUR

Atlas Steels, Ltd., Welland, Ont., Canada, recently installed an R-S "Hi-Head" Furnace for heating stainless steel slabs for rolling. The furnace is designed to heat 25 tons of slabs 20" wide and 2½" maximum thickness per hour. They are fed through the 73-ft. furnace in long slab lengths. The "wrap-around" flame action brings the steel to rolling temperatures rapidly, with a significant reduction in scale produced. The quick heating permits a fast start from cold and a furnace capacity of 330 pounds per square foot of hearth area as compared to normal capacities of 50 to 75. Write for complete details.

* "Hi-Head" Furnace Patented.

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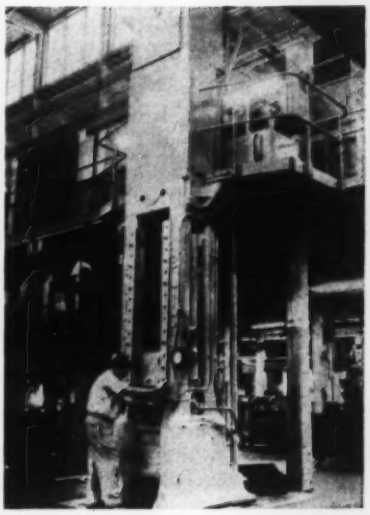
HARDINGE COMPANY, INC.

QUALITY FURNACES SINCE 1908



Deeper Drawing

Long stroke Hydro-Dynamic press for deep drawing and reducing work has recently been installed at Worcester Pressed Steel Co., Worcester, Mass. The press has 75-ton capacity and 60-in. stroke making it well suited to work such as shell case drawing. Maker is E. W. Bliss Co., Canton, O.

Machine Tool Data

Prepared for engineers, methods departments and lathe operators as a guide to establish proper cutting speeds and feeds, a 36-page technical booklet has just been completed by Monarch Machine Tool Co., Sidney, O.

Monarch's research forms the basis for machinability ratings, tool angles and recommended speeds and feeds for a wide range of ferrous and nonferrous alloys.

Coolants—Suggestions on coolants are offered for tool steels, stainless steels and nickel, copper, aluminum and magnesium alloys.

Several pages are devoted to what happens during the metal cutting process, with an accompanying evaluation of the forces acting upon a lathe tool under different conditions of feed and speed.

Tables of machinability ratings, speed and feed charts and a number of graphs relating rates of feed to development of tool cutting forces are included. The manual is available in limited quantity only.

Requests for copies should be made on business letterheads and addressed to the company's advertising department.

Just off the press—

THE HOW AND WHY OF BETTER QUENCHING WITH GULF SUPER QUENCH

GULF SERVES INDUSTRY

GULF OIL CORPORATION · GULF REFINING COMPANY

Room 1822, Gulf Building, Pittsburgh 30, Pa. S

Gentlemen:

Please send me, without obligation, a copy of your new 24-page brochure dealing with the application and advantages of Gulf Super-Quench.

Name_____

Title_____

Company_____

Address_____

1 First step in making evaporators: Aluminum is cut, pierced and formed . . .

2 Extruded tubing, which carries the refrigerant, is bent and formed to required size . . .

METALS AT WORK

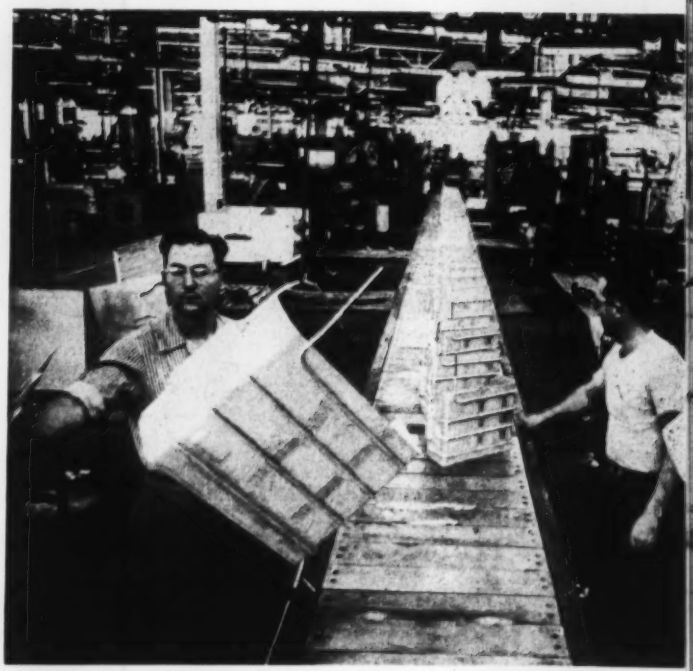
Fabricators . . .

ALUMINUM'S fabricating qualities and performance record make it a natural for refrigeration construction. The production of evaporators typifies the ready adaptability of the metal to processing and exact control.

Refrigerant absorbs heat through the walls and tubing of the evaporator. The better the evaporator conducts heat, the more efficiently the refrigerator operates—another reason aluminum gets the call.

Because refrigeration is a continuous cycle, it's equally important that there be no refrigerant loss. Close control in production, durability in use are essential.

Bohn Aluminum & Brass Corp., Detroit, shows some of the steps it takes to turn out evaporators, moving through fabrication, surface finishing and inspection.

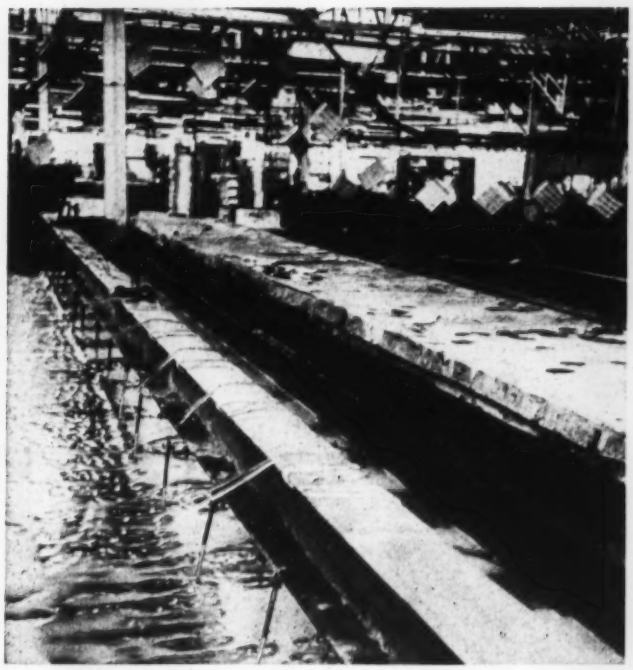


5 Final evaporator assembly includes a series of forming, riveting and inspection steps . . .

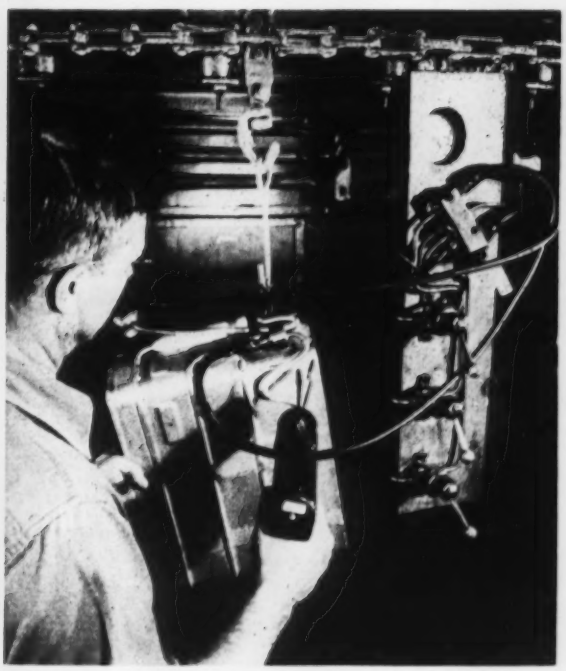
3 Sheet and tubing are oven-brazed at temperatures reaching more than 1000°F . . .

4 Flash butt welding joins a short length of copper tubing to the aluminum for final assembly . . .

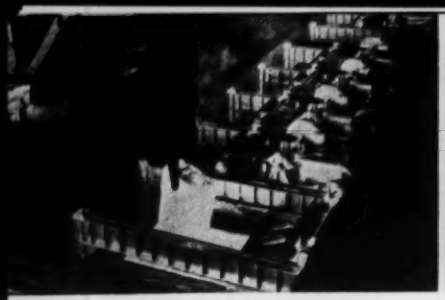
. . . Call on Aluminum



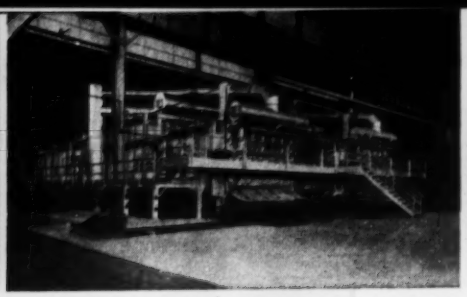
6 Anodizing solution of sulphuric acid puts protective coating on assembled evaporator . . .



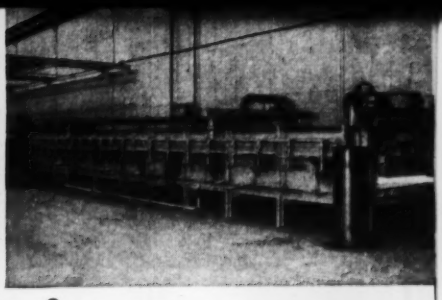
7 Snifter test inspects gas-charged tube joints, reacts to most minute leakage.



1 One-way fired recuperative soaking pits.



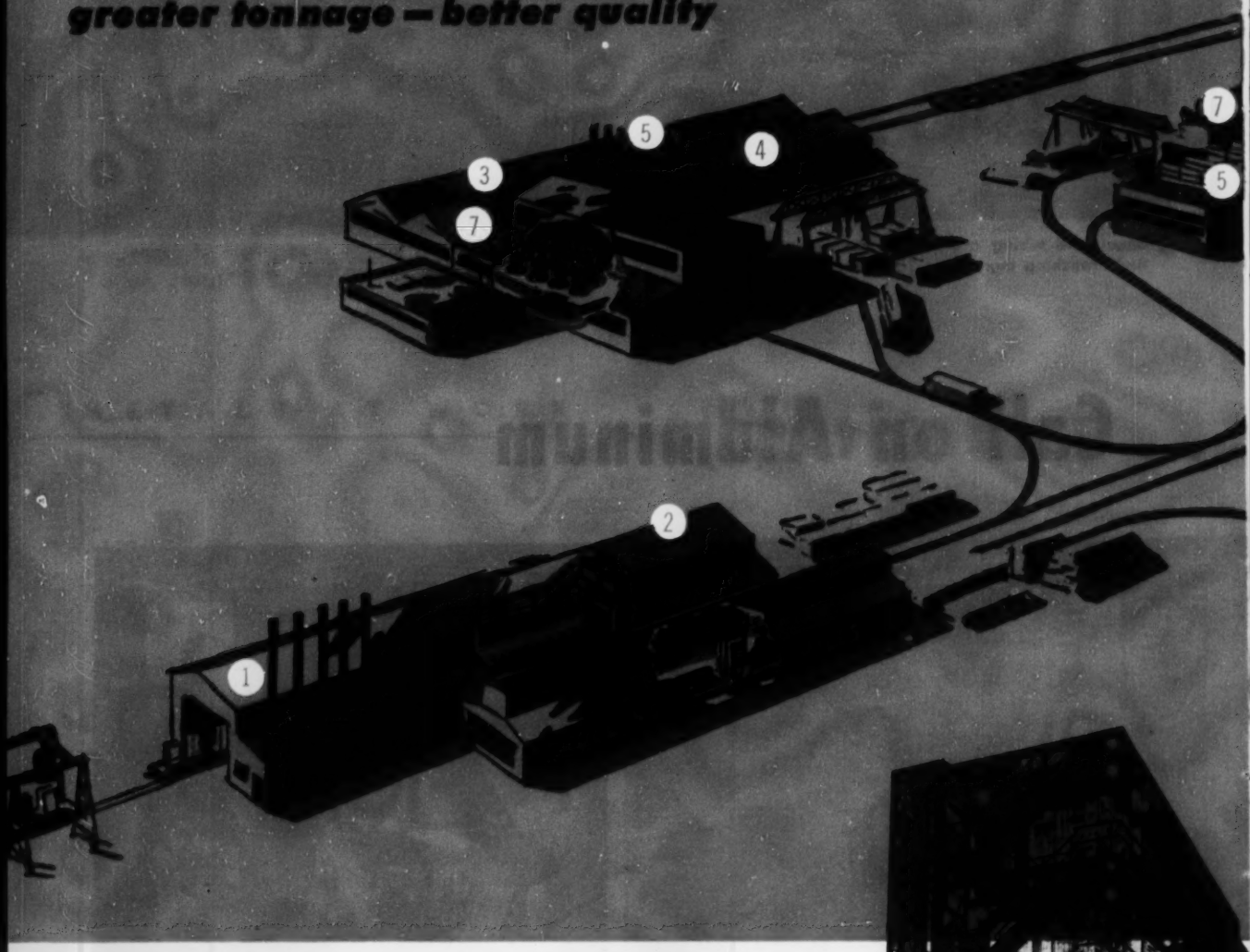
2 Continuous slab and billet furnaces.



3 Continuous wire patenting furnaces.

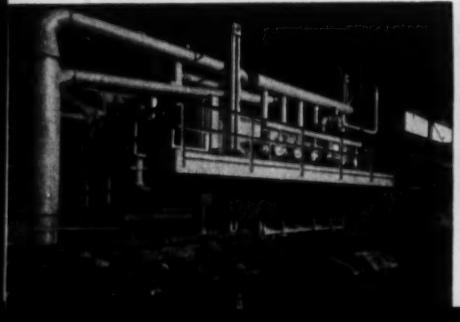
DIVIDENDS DECLARED DAILY

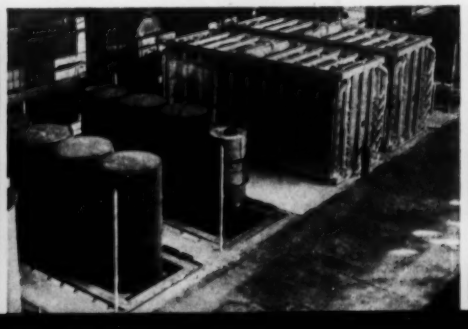
greater tonnage — better quality

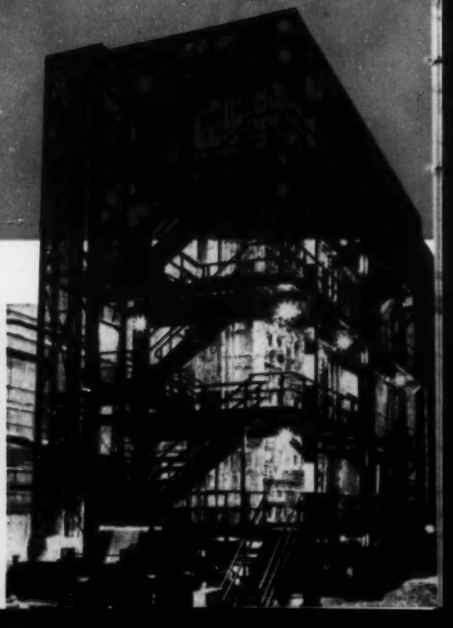


7 Continuous billet reheating furnaces.

8 Controlled atmosphere coil annealing covers.

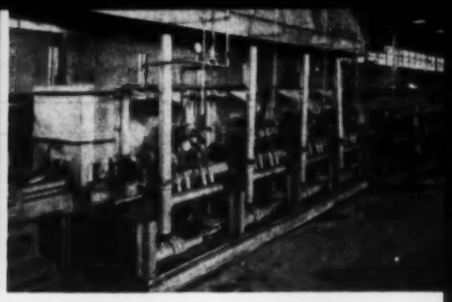




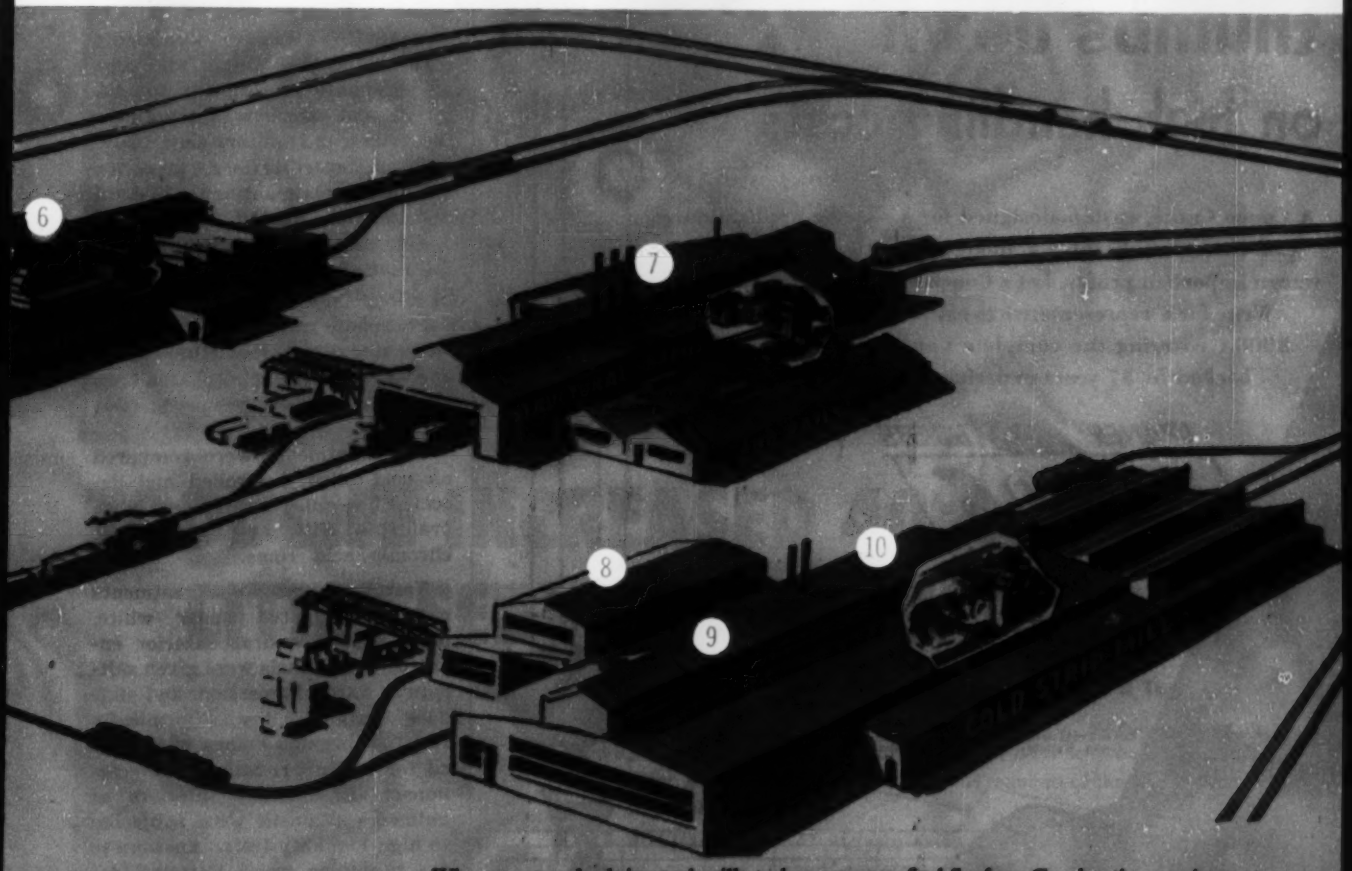


4 Pit type rod annealing furnaces.

5 Continuous roller hearth controlled atmosphere carbon restoration and annealing furnaces.



6 High-speed stress relief furnaces for steel tubing



Wherever you look in steel mills today, you can find Surface Combustion equipment declaring daily dividends in greater tonnage and precise quality control. These are dividends returned to the customer from 50 years of research, development, and experience in heating and handling steel.

'Surface' furnaces, soaking pits, annealing covers and controlled atmosphere generators have been specified time after time for postwar modernization by steelmen who expect their equipment investments to be gilt-edge securities.

If you are planning an investment in steel mill furnace equipment, put it where it will return dividends every day—in equipment built by 'Surface'.

◀9 Continuous strip annealing furnaces for tin plate.

10 Continuous strip galvanizing lines.

Foreign affiliate companies:

British Furnaces, Ltd., Chesterfield
Stein & Atkinson, Ltd., London
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Surface
STEEL MILL FURNACES

SURFACE COMBUSTION CORP. · TOLEDO 1, OHIO

thumbs down
on high handling costs

A Conco Crane, custom-designed for a specific application, can cut costs sharply. A modest crane investment can return important profits. Let a Conco engineer show you how. Write for a representative to call, or ask for Bulletin 3000A covering the complete Conco Crane line—a line backed by 37 years experience.

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Conco Building Products, Inc.—Brick, Tile, Stone

(*Continued from p. 93*)

Synthetasine 200, just released, is produced in a soft, gray color, as well as in a clear or unpigmented type. The latter has the advantage of wider ranges of curing cycles than the 100.

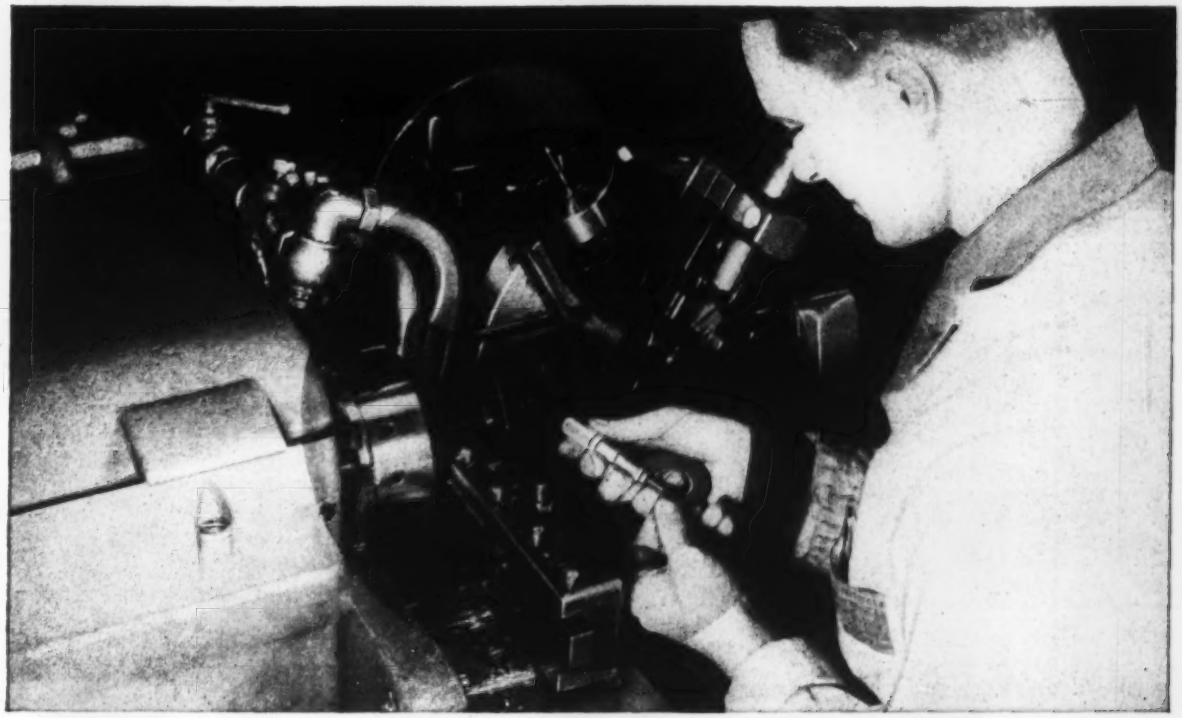
Which Phosphate? — Another phase of SSCI research at Battelle evaluates phosphate treatment: Finding the best weight and type of phosphate coating for the interiors and exteriors of containers for civilian and military uses. (Government specifications prescribe phosphate treatment under Federal Specification RR-D-729a, or JAN C-490; these specifications are being revised for specific application to steel drums.)

Phosphate treatments studied include zinc phosphates (three types and weights), iron phosphates (two types) and scale removers (two types).

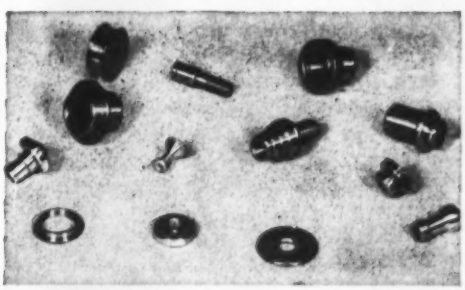
The treatments were compared on cold-rolled, hot-rolled and descaled hot-rolled steel. Some were evaluated with and without a chromic acid rinse.

Test Punishment — Treatments were investigated under white, black, and olive-drab exterior enamels. Test panels were given salt-spray, water immersion and outdoor weathering tests. Chemically resistant organic linings were tested for product-resistance, reverse-impact and ductility. Interiors of unlined containers were subjected to high-humidity tests. Answers to the questions posed Battelle (see below) have helped steel container manufacturers select the type of metal treatment that best fits each manufacturing operation and meets military specifications and civilian needs.

Versatile Example—One such installation is at the Ohio Corrugating Company, Warren, O., a seven-stage operation including alkali wash, cold-water rinse, hot-water rinse, phosphating, cold-water rinse, chromic acid rinse and forced dry off. It was designed for flexible operation. The interior and exterior of the drum or the exterior alone can be phosphated. The equipment has been used for iron and zinc phosphating solutions, plus cleaning without phospating.



TOOL LIFE INCREASED 40% USING CITIES SERVICE CUTTING OIL



ONE OIL FOR ALL? After poor results with many cutting oils, the Dunbar Machine & Tool Company discovered all their cutting jobs could be done to perfection using only one oil . . . Cities Service Chillo #44.

NO EYE STRAIN. In addition to a 40% increase in tool life, owner Robert Dunbar found that the transparent characteristics of Chillo #44 help eliminate eye strain. Cutting operation is easily visible to operator.

Production Also Up, Reports Dunbar Machine & Tool Co.

THE PROBLEM . . . The Dunbar Machine & Tool Co., Massillon, Ohio, had a problem. It seemed impossible to find one oil which would perform economically and efficiently for ALL the jobs required of the firm's automatic screw machines.

THE SOLUTION . . . After trying many brands of cutting oil, "none of which gave good all-round performance," owner Robert Dunbar called in a Cities Service engineer. After careful analysis of the problem, the engineer recommended Chillo #44 cutting oil.

THE RESULTS . . . Using Chillo #44, the company observed these results: Tool life increased nearly 40% . . . Production increased accordingly . . . Additional savings realized due to chip draining characteristics of oil . . . Holding tolerances no longer any problem . . . Machine clean-up time now insignificant . . . Transparency of oil eliminates eye-strain . . . Less smoke and fumes at high speeds . . . Also excellent for lubricating purposes. Says Mr. Dunbar, "Our results with Chillo #44 permit us to heartily endorse this product."

If you have a cutting oil problem, consult your nearest Cities Service representative or write Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

"Thinness Control" means that the decimal thickness of each sheet is uniform throughout the length and width.

Job costs are figured on a square foot basis while stainless steel is purchased on a weight basis. When stainless steel is ordered by gauge number the permissible A.I.S.I. thickness variation is plus or minus 10%. If you receive material on the heavy side of the gauge range you are paying a premium for stainless surface area. For example, if you order 18 gauge, you may receive sheets .052" thick, when a thickness of .0475" would suit your purpose. On a standard 18 gauge sheet (36"x 120") each .001" in thickness weighs 1.26 pounds per sheet. In this example, each stainless sheet could weigh as much as 5.67 pounds more than required. You can readily see the advantages of specifying stainless rolled to the light side of the gauge range. MicroRold stainless is rolled to exceptionally close tolerances, as low as 3% average (plus or minus). Regular use of MicroRold provides more stainless area per ton or the equivalent area with lesser weight.

If you are not now a user of MicroRold sheet it will pay you to get the full details. Your steel distributor will gladly tell you the MicroRold story.

Washington Steel
Corporation
WASHINGTON PENNSYLVANIA

Progress . . .
(*Continued from p.* 102)

anneal and pickle line at Atlas has one "first" . . . an in-line electrolytic salt bath descaler. By running strip through baths of fused salt and alternately changing polarity, scale is oxidized in one tank and dissolved in the next. Teaming this scale removal with conventional acid pickles gives just about any desired finish, even on the 400 series.

This line takes either hot or cold strip through any combination of treatments. On leaving the anneal and pickle line, hot band is ready for cold rolling on a Sendzimer mill at speeds up to 500 fpm. If fine finish is required, strip can be rolled to final gage on a Treadwell skin pass mill.

Sheets and Tubes — In another section of the cold finish department is a side trimming and slitting line, a level and shear line for sheets together with an inspection line. A good bit of the strip is slit into skelp widths for the company's new tube department.

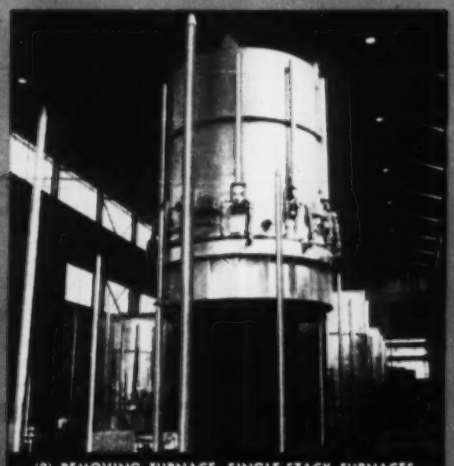
Equipment in this section includes a continuous tube forming and welding machine, bright annealer, draw bench, straightener and all the intermediary equipment for cutoff, testing, degreasing, etc.

Will It Pay?—This question was posed to one of the operating officials at Atlas. "You figure it out," was his reply. "It's pretty easy to see the savings on the continuous caster, and to duplicate the projected output of the hot mill with conventional rolling equipment would cost eight to ten times what we have invested there. As for the other finishing equipment, it's the most modern and efficient we could buy. It doesn't look like much of a gamble," he added.

Previous to this expansion, Atlas' entire production of some 200 kinds of specialty steels had gone into conventional ingots for later hot working on the blooming mill, 1000-ton forging press or 12,000-lb steam hammer. Stainless sheet and plate will still continue to be made on the company's hand mills; in fact, some of the work of the new hot planetary will be to roll 1-in. sheet bar for those mills.

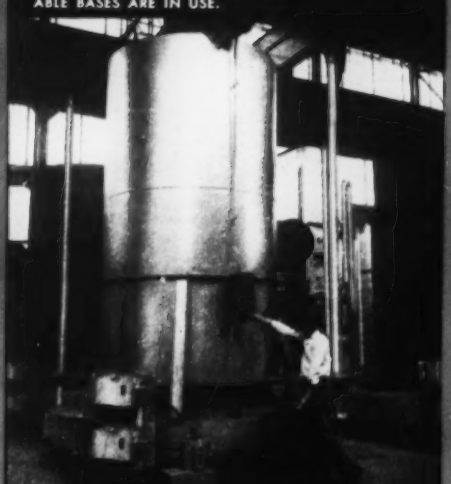
SINGLE-STACK SCORES AGAIN WITH MAJOR ANNEALING JOB . .

(1) OVERALL VIEW OF THE LATEST LEE WILSON SINGLE-STACK ANNEALING FURNACE INSTALLATION. THIS PARTICULAR OPERATION COMPRISES 12 FURNACES AND 37 BASES. THE SET-UP: THREE BASES PER FURNACE WITH ONE EXTRA, OR SPARE, BASE.



(2) REMOVING FURNACE. SINGLE-STACK FURNACES ARE SELDOM IDLE. THE FURNACE, HERE, WILL BE DROPPED ONTO THE INNER COVER AT THE LEFT AND ANNEALING WILL CONTINUE WITHOUT DELAY.

(3) LEE WILSON PORTABLE BASE BEING REMOVED. ONLY THREE SIMPLE CONNECTIONS NEED BE MADE. NOTE SMALL TRENCH THAT RUNS BENEATH BASE — THE ONLY EXCAVATION REQUIRED WHERE PORTABLE BASES ARE IN USE.



(4) FORCED COOLER PLACED OVER INNER COVER SPEEDS COOLING CONSIDERABLY.

Here's the latest major annealing installation to be set into operation, and like all others in the past two or three years it is 100 per cent Single-Stack.

Why this tremendous swing to Single-Stack annealing? We can best explain by repeating the reasons this leading steel producer gave when he placed the order.

THE SINGLE-STACK GIVES MUCH GREATER FLEXIBILITY. We can get into business as soon as a single base is loaded. We can select coils of similar size and regulate the charge time accordingly.

THE SINGLE-STACK GIVES MUCH GREATER CONTROL. The heating elements entirely circle the charge. No part of the surface of any coil is heated more than any other.

THE SINGLE-STACK GIVES GREATER PRODUCTION. The Lee Wilson "O" Tube gets more BTU's into the furnace more efficiently . . . cuts heat loss to a minimum. Charge heats faster when heat is applied from all sides.

THE SINGLE-STACK ENABLES US TO UTILIZE THE PORTABLE BASE. This means we never have a base out of commission. We're at full strength all the time.

These statements are general. They are backed by the operational records of leading annealers the nation over. Why not get all the facts? They're available by writing . . .

Lee Wilson

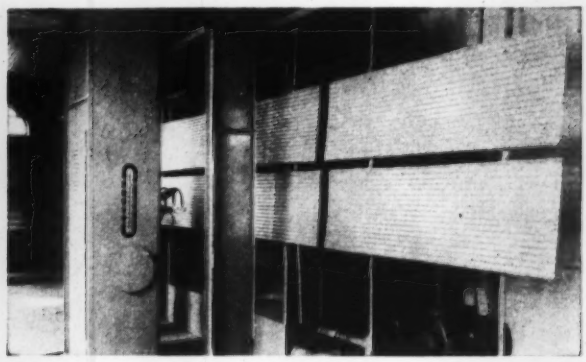
ENGINEERING COMPANY, INC.

CLEVELAND, OHIO

Is automatic painting your next step to lower production costs?

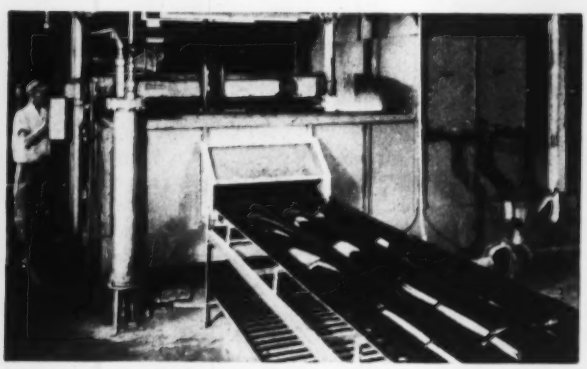
DeVilbiss Automatic Spray Machines cut finishing costs as much as 2/3 and reduce rejects to a negligible number for manufacturers of household appliances, building materials, industrial equipment, soft goods and thousands of other mass-produced items.

Vacuum cleaner housings like these are typical of the parts that can be finished automatically at rates from 540 to 4320 pieces per hour on DeVilbiss Chain-on-Edge Machines.



Parts traveling on overhead conveyors, such as these panels, can be quickly coated both front and back with any material on DeVilbiss Automatic Vertical Transverse Machines.

DeVilbiss Automatic Rotary Machines spray a great variety of industrial products economically and quickly, with absolute uniformity. The operator need only load and unload the table conveyor.



Coating speeds from 3,000 to 14,000 square feet per hour are possible with DeVilbiss Automatic Horizontal Transverse Machines. Here, carpet-sweeper tops emerge with a gleaming finish.

How about *your* company? Is there a job out in the shop that could benefit from the high speed, the smooth, uniform finishes DeVilbiss Automatic spray-painting equipment brings about? Whether you're working with flat objects, parts traveling on overhead conveyors or parts that require both inner and outer coatings, you'll find DeVilbiss has a wide variety of standardized automatic machines to serve you. Call your local DeVilbiss representative for full details.

THE DEVILBISS COMPANY, Toledo, Ohio

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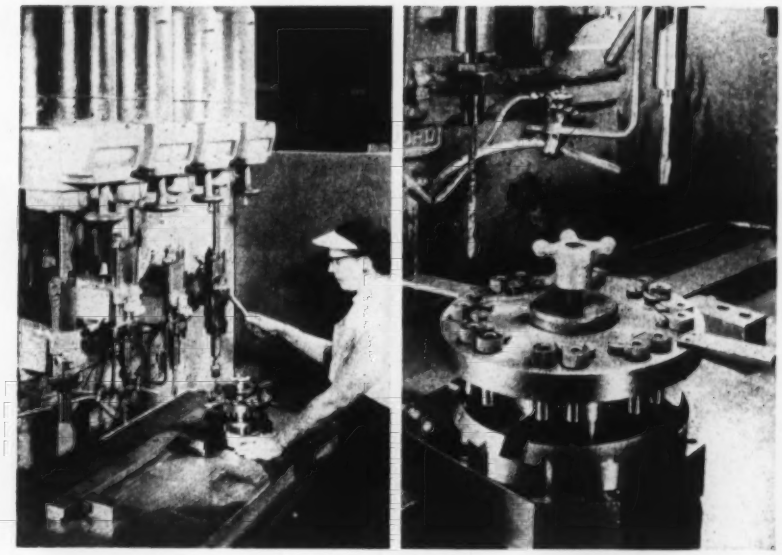


Closeup of the fixture for drilling, counterboring and tapping a jet engine part shows bushings which locate 16 holes. Time cut was 12 minutes per piece

Jet Part Cost Cut

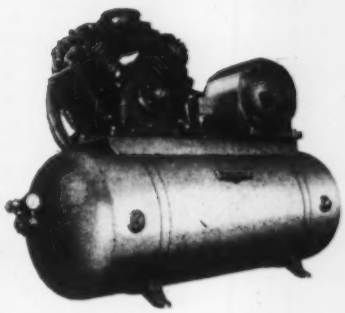
Expensive jet engine casting—too costly to scrap—is machined with precision spindles. Result is a 12-minute cut in cycle time on this job

THEY'RE SAVING time and money on an already expensive jet engine casting at Thompson Products Inc., Cleveland. One critical operation on the aluminum part is drilling, counterboring and tapping a series of 16 holes around the periphery.

Tough part of the job comes with the usual tight tolerances for jet parts. Job was formerly tedious, requiring considerable skill and patience on the part of the operator. Engineers say that the part actually was too expensive to scrap—and so time was taken to do the job right.

Machine Switch — Part is now mounted in a fixture which locates all 16 holes at once. The job is set up on a multiple-head Leland-Gifford drilling unit. First head drills the holes, second counterbores and the third taps the counterbores. Holes are about ¼-in. in diameter by ⅝ in. deep. Counterbore is about 15/32-in. in diameter.

Time on the job now is 48 hours for 100 pieces. Previously it took 68 hours for the same number of pieces. According to engineers at Thompson, most of the time saving accrues from the continuity of good holes that come off this machine. Precision spindles keep the tools in line. There is no need to rework parts to bring them in tolerance.



New DeVilbiss Air Compressor pays for itself

It's true. Many times a new DeVilbiss Air Compressor will actually pay for itself *out of power savings alone!* DeVilbiss Air Compressors give you up to 22.6% more air per power dollar. You gain, too, in lower maintenance and depreciation costs. If you have a compressed air problem, contact your local DeVilbiss jobber today.

Every DeVilbiss Air Compressor, from ½ to 15 hp., offers you: A Dependable DeVilbiss Compressor Unit, Check Valve Manifold, Automatic Pressure Switch, Quality Electric Motor or Gas Engine, A.S.M.E. Tank, Outlet Manifold and Quiet Efficiency V-belt Drive.

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FOR BETTER SERVICE, BUY
DEVILBISS

New G-E TRI 55 CLAD Motors

REG. U.S. PAT. OFF.

NOW AVAILABLE THROUGH 10 HP!

Prompt Service, Quantity Shipment on these new motors...

TRI/CLAD '55' MOTORS—3-PHASE, 60 CYCLES, NEMA DESIGN B

HP	3600 RPM	1800 RPM	1200 RPM	900 RPM
½				K182 220/440v*
¾			K182 220/440v*, 550v	K184 220/440v*
1		K182 208v, 220/440v*, 550v		
1½	K182 220/440v*, 550v	K184 208v, 220/440v*, 550v	K184 220/440v*, 550v	K213 220/440v*
2	K184 220/440v*, 550v	K184 208v, 220/440v*, 550v	K213 220/440v*, 550v	K215 220/440v*
3	K184 220/440v*, 550v	K213 208v, 220/440v*, 550v	K215 220/440v*	K254U 208v*, 220/440v*, 550v*
5	K213 220/440v*	K215 208v, 220/440v*	K254U 208v*, 220/440v*, 550v*	K256U 208v*, 220/440v*, 550v*
7½	K215 220/440v*	K254U 208v*, 220/440v*, 550v*	K256U 208v*, 220/440v*, 550v*	
10	K254U 208v*, 220/440v*, 550v*	K256U 208v*, 220/440v*, 550v*		
15	K256U 208v*, 220/440v*, 550v*			

...and fast delivery on Sample Motors through 20 hp!

7½				284U 208v*, 220/440v*, 550v*
10			284U 208v*, 220/440v*, 550v*	286U 208v*, 220/440v*, 550v*
15		284U 208v*, 220/440v*, 550v*		
20	284U 208v#, 220/440v#, 550v#	286U 208v*, 220/440v*, 550v*		
25	286U 208v, 220/440v, 550v			

*** Indicates totally-enclosed motors also available.**
 # Dripproof only, TEFC available in 286U frame.

All motors obtainable with NEMA "C" face and "D" flange end shields, foot mounted or round frame. Splashproof motors in all ratings.

Motors can also be obtained for 50 cycles. 254 and 256 frames available in high starting torque or high slip NEMA designs C or D, except 3600-rpm motors.

There is prompt service on specials in the above sizes, too! Also new Tri/Clad '55' single-phase, wound-rotor, and hermetic motors are available.

If you wish the G-E Tri/Clad motor in the original design, they are still available . . . in ratings listed above and in ratings to 2000 hp.

To get even more recent availability information on standard and special motors, contact your nearest G-E Apparatus Sales Office or G-E motor supplier. *General Electric Co., Schenectady 5, N. Y.* 648-22

GENERAL ELECTRIC

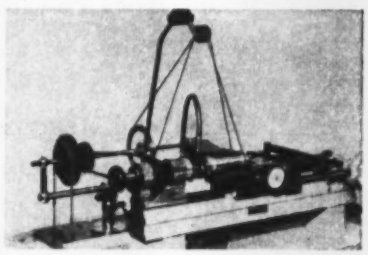
Microdrilling

OPERATORS without special skills can microdrill holes as small as 0.0016 in. with special equipment announced by Louis Levin & Son Inc.

On this type work, the drill must be absolutely centered with the work. With this new drilling attachment, the spindle is mounted on a pair of adjustable slides, making it possible to center the spindle on any lathe.

Method — Centering is done as follows: A small rod is placed in the lathe head and drilling spindle with a pivot measuring 0.004 in. Two pivots are brought end to end, and the slides adjusted until they form a single hair line under a strong glass.

When the operator applies pressure to the handle on the slide, the slide is kept against a stop screw. This screw has a dial that controls its movement. It cannot advance any faster than the dial is turned by the operator. A second adjustable stop screw controls the final depth of the hole. The operator can observe drilling progress registered on the dial.



DRILLING APPARATUS
. . . no special skill is needed

Recommendation — Pivot drills or watchmaker drills are recommended for work done without centering. This type has an oversize shank and is exceptionally rigid for its size.

When the depth of the hole exceeds the length of the flutes of a pivot drill, it is used only for starting the hole. The hole is finished with a regular twist drill. If the hole is smaller than the smallest commercially available twist drill, a pivot drill is used with the depth limited by the length of the flutes.

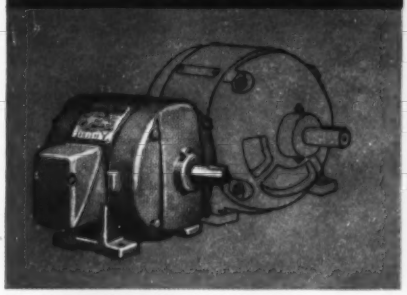
8 reasons why you should

MODERNIZE EQUIPMENT WITH TRI 55 CLAD MOTORS

REG. U.S. PAT. OFF.

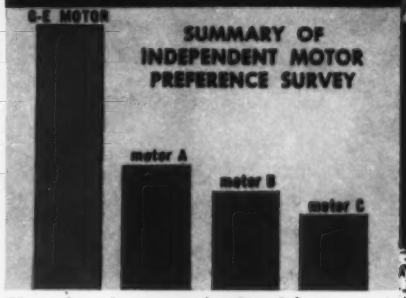
Plan now to modernize your equipment with the all-new General Electric Tri/Clad '55' motor, available now in many ratings; entire line of 1 to 30 hp a-c motors available soon. Contact your G-E Representative. General Electric Company, Section 648-6, Schenectady 5, N. Y.

MORE POWER PER POUND



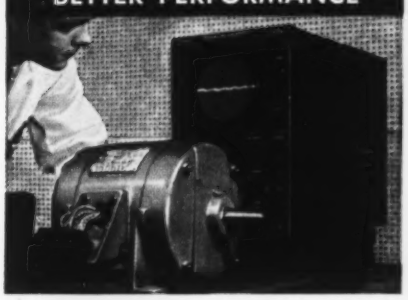
Lighter and smaller Tri/Clad '55' motors in new NEMA frame sizes and ratings save you space and weight, reduce handling costs.

BUYER PREFERENCE



You take advantage of a 2 to 1 buyer preference for the electric motors on your equipment when you buy or specify a G-E motor.

BETTER PERFORMANCE



Quieter operation, proved by sound-room tests, is typical of the many performance improvements in the new G-E Tri/Clad '55'.

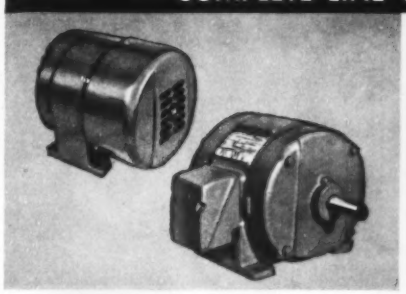
LONGER LIFE

A silicone Dri-film* coating makes insulation shed water—lengthens motor life. Polyester-film insulation is 8 times stronger.

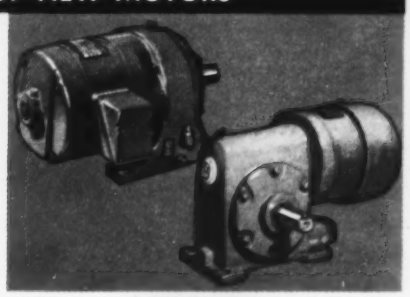
EASIER INSTALLATION

Perma-numbered leads are always instantly read even when wires are taped or clipped. Conduit box has plenty of knuckle room.

COMPLETE LINE OF NEW MOTORS



A complete line of new motors assures the right electrical drive for your machine. Write for Bulletin GEA-6013 on dripproof motors,



GEA-6012, on enclosed motors. For low speed jobs, G.E. offers a complete line of gear-motors. Write for Bulletin GEA-6027.

NEAR-BY SERVICE

CLASSIFIED
Electric Repair Service
—(Continued)
GENERAL ELECTRIC
SMALL MOTOR SERVICE STATION
Complete facilities for in and out-of-warranty repair or exchange of A-C and D-C motors and generators to 15 HP. Authorized distributor G-E motor renewal parts and G-E single-phase motors.
"WHERE TO CALL"
AUTHORIZED G-E MOTOR SERVICE
Street Address..... Phone No.

G-E service is as close as your telephone. Authorized motor service stations provide repair-facilities in all major trading areas.

*Reg. trade-mark of General Electric Co.

Progress is our most important product

GENERAL ELECTRIC

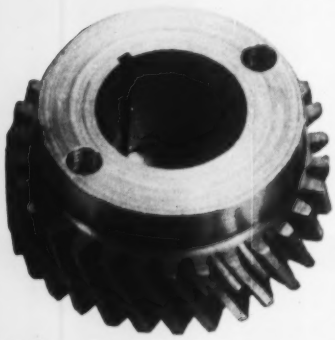
Close Tolerance

High Strength

YOU CAN HAVE ALL SIX ... PLUS *Uniform Machinability*

Fine Surface

Toughness



Hardenability

Maybe you want some of these properties in your steel parts. Or a combination of them. Or only one.

No matter which ones you need, you get them—plus *uniform machinability*—in Republic Cold Drawn Steels.

That's why so many manufacturers have come to Republic with their machining problems. Manufacturers whose costs and production records show their automatics aren't turning out what they could.

Republic's 3-D Metallurgical Service focuses the combined experience of the Field, Mill and Laboratory on your particular problem. And the recommendation you get is based on your plant, your product, and your equipment.

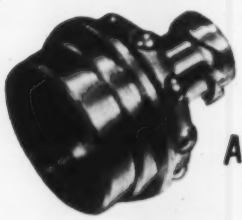
There's no reason to deny yourself this service. It costs only the price of a phone call to your nearest Republic office. And it can save you a lot. Do it today.

REPUBLIC STEEL CORPORATION

Union Drawn Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department; Chrysler Building, New York 17, New York



Accuracy of Section

REPUBLIC COLD DRAWN ALLOY STEEL BARS

REPUBLIC STEEL

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Bars, Wire, Pig Iron, Steel and Plastic Pipe, Bolts and Nuts, Tubing

Radio for Noisy Areas

Extra power improves communications in the hard-to-hear plant areas

YOU CAN keep in touch with work crews, headquarters and vehicles in noisy industrial areas with Motorola's packaged two-way radio system.

Receiver, transmitter and power supply with an audio booster amplifier fit into a standard 15 in. housing. The unit operates with a 6- or 12-volt battery. Audio output is 10 watts. R. F. output is 25 watts. A waterproof marine speaker is used.

Modifiable—The basic radio may be equipped with a weatherproof housing and shock mountings. A swivel mounted, marine type speaker can be substituted for the fixed position one. A cab speaker enables the user to connect into the circuit the cab speaker, marine speaker or both. A multiple speaker with up to five inverted cone speakers can be obtained.

Trucks carrying the units may be directed from distances by Handi - Talkie radiophones or Handi-Micro-Talkie transmitters operating through the radio receiver and booster amplifier, according to Motorola.

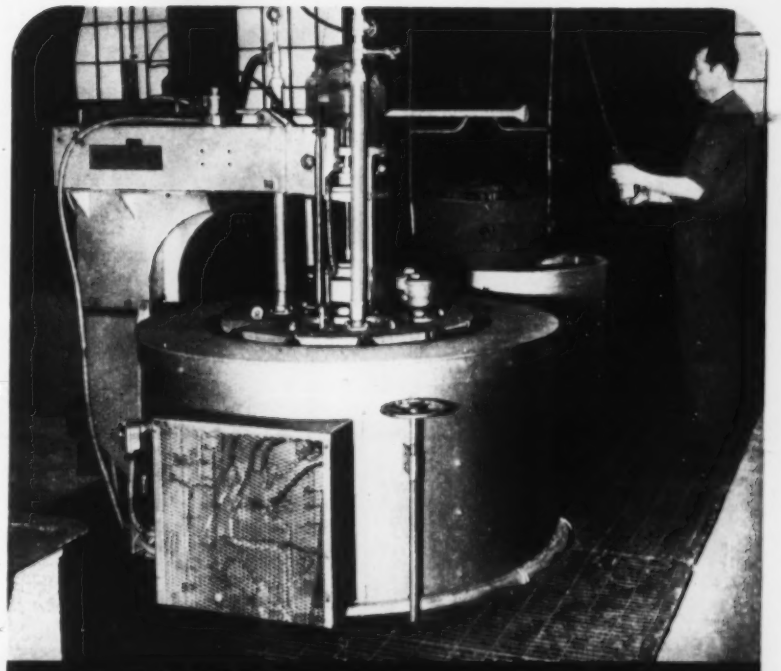
The radio is designed for operation on one or two frequencies.

Press Glossary

A glossary covering all types of hydraulic and compression molding presses, frame elements, cylinders, press control systems and components, pumps and controls is offered by Engineering Standards Committee, Hydraulic Press Section, National Machine Tool Builders' Association. (It's aimed at the interchangeability of dies and fixtures.)

The first of five studies on the problems of standardization, the report will be followed by others on metalworking presses, vertical open gap presses, compression and plunger molding presses and accumulators.

The glossary may be purchased from the association, 2071 East 102nd St., Cleveland, for 75 cents a copy.



CARBURIZING TIME CUT 4 HOURS with a HEVI DUTY FURNACE

Electrol Inc., manufacturers of hydraulic devices, carburizes landing gear orifice tubes in 3 hours instead of 7 hours formerly required by the pack method.

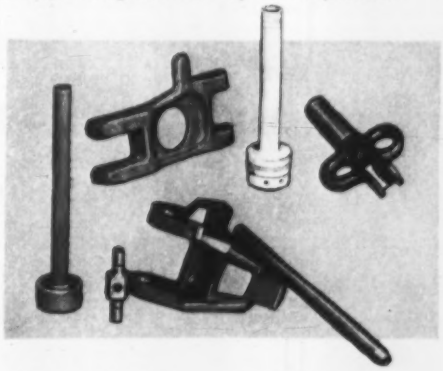
Edgar B. Roesch, Factory Manager, says, "With this Hevi Duty Retort Furnace, we can produce a more uniform case faster because —

Forced Circulation assures even case depth throughout the densest loads.

Zone Temperature Control helps bring the load up to temperature more quickly and evenly.

Positive Pressure inside the retort has simplified the obtaining of exact carbon concentrations on the surface of the work and to specified depths."

The carburizing atmosphere is supplied from a Hevi Duty Endothermic Generator to which natural gas is added. This atmosphere protects the work from scaling which results in a further saving of 50% in surface finishing time.



Write for Bulletin HD-646-R and more information about how the Hevi Duty Retort Furnace is used for carburizing, hardening, nitriding, and bright annealing.

HEVI DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

SOLAR'S

SURE-SPEC STEELS

steel for any part
you make for any product
anytime at minimum cost!

Solar furnishes steel to the makers of the famous Ironrite electric ironers. Shown is the deluxe model which makes ironing a breeze in ⅓ the time required by hand.

"for service dependable as the sun"

SOLAR STEEL CORPORATION

General Offices • Cleveland, Ohio

SALES OFFICES: Bridgeport • Chicago • Cincinnati • Cleveland • Detroit • Grand Rapids
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FLAT ROLLED AND BAR AND TUBE STOCKS AND PROCESSING SERVICES FROM 11 PLANTS

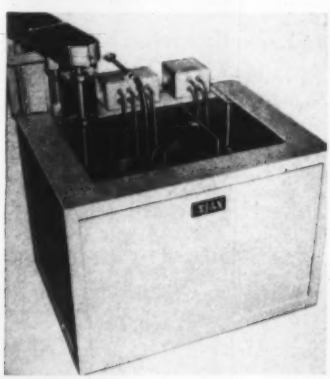
NEW PRODUCTS and equipment

Reply card on page 139 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Salt Bath Furnace

. . . isothermal quenching

Steel products that can't be austempered or martempered can be heat treated by the isothermal quenching process with this new quench furnace. Cataract quenching increases the cooling rate in the critical 1300 to 1000°F range, getting past the nose of the "S"



curve. Any steel that can be satisfactorily hardened by oil quenching can be martempered or austempered in this Cataract Quench Furnace.

The secret is the uniform, high velocity downward flow of salt confined within a special quench header. Ajax Electric Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 1

Speed Nut

. . . spring steel

Assembly is fast and simple. The nut is placed over a tapped hole in the chassis with its positioning tab inserted into a rectangular slot. The screw is then driven into the tapped hole. The fastener is depressed slightly before the screw enters it. This depressed arch creates an outward spring action to provide the necessary tension on the tapped hole.

Such tension holds the adjustment screw at the desired position. The spring-steel fastener may be used indefinitely. Tinnerman Products Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 2

X-Ray Unit

. . . portable

This unit is capable of producing a 360 degree radiation sweep. Many products can be set up in a circle around the business head and all can be x-rayed with a single exposure. Inside pipe or pressure vessels, it takes inside out x-ray views.

Model OX-175 has a tank to house the x-ray tube, which is linked to control and power source by inter-connecting cables. It can be mounted and used in field, shop

and laboratory. It can be operated at x-ray tube voltages of from 45,000 to 175,000. General Electric Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Direct Measurer

. . . for uneven surfaces

The microscope will obtain accurate readings of dimensions, radii, angles and holes. Linear dimensions are given both in decimal inches and millimeters. Direct linear measurements may be taken up to ½ in. in units of 0.005 in. Working distance between objective and object being examined is 5½ in.

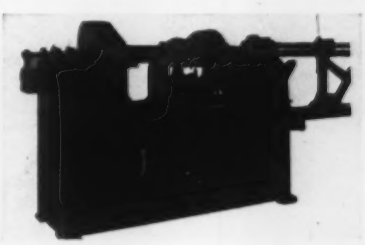
The Edscorp's two outstanding features are versatility, plus the erect image obtained with a prism system. Edmund Scientific Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Straightening Equipment

. . . square, rectangular wire

Square or hex wire, 3/16 to ¼ in. or flat wire, 1/16 x ¼ to 3/32 x ½ in., are straightened and cut automatically on the Shuster model 2ABF. Multiple sets of precision straightening and feeding



rolls handle the wire easily and uniformly for long production runs. Predetermined lengths are cut with accuracy.

There is almost continuous wire movement, minimizing marking and assuring square cut ends. Mettler Machine Tool Inc.

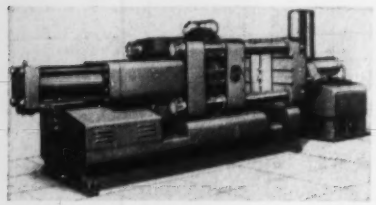
FOR MORE DATA CIRCLE REPLY CARD NO. 5

Die Casting Machine

. . . works automatically

The new clamp offers a combination of hydraulics (for smooth, precisely controlled movements and transmission of energy) with a simple mechanical linkage and wedge for multiplication of power. It limits dimensional

elongation or compression, preventing die blow on overload or



with off center loads.

The injection end is a compact, self contained unit. Compactness greatly reduces line breaks or leaks. It features a speed control operating valve that brings a variable acceleration and speed control to metal plunger action. Hydraulic Press Mfg. Co.

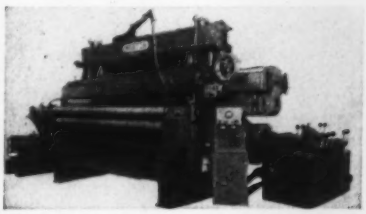
FOR MORE DATA CIRCLE REPLY CARD NO. 6

Welding, Trimming Machine

. . . for alloy sheets, strip

It handles coil ends or flat sheets into position for submerged arc or gas shieled welding. At the same time, it welds and trims the weld bead from both sides, without unclamping or transferring the welded seam.

The machine is arranged for welding and trimming seams 10



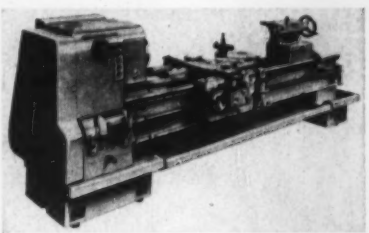
ft long in 1/16 to ¼ in. stainless or other alloy sheets and strip. Pinch rolls are furnished, the top roll being hydraulically loaded for holding the sheet flat. Any number of sheets of any width up to 10 ft long can be efficiently joined. Morton Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 7

Tray Top Lathes

. . . 12 spindle speeds

They have 12 spindle speeds in geometric progression, a three lever color match, direct reading shift mechanism. The spindle, with a long taper key drive nose,



is rigidly mounted in three precision anti-friction bearings. All headstock bearings are pressure lubricated with filtered oil.

The apron is a one piece, double walled casting with automatic lubrication. Bedways are ground. A fully enclosed electrical panel provides a safe accessible place for the power connection. They are offered with a 5 or 7½ hp motor mounted on the rear of the headstock. Cincinnati Lathe & Tool Co.

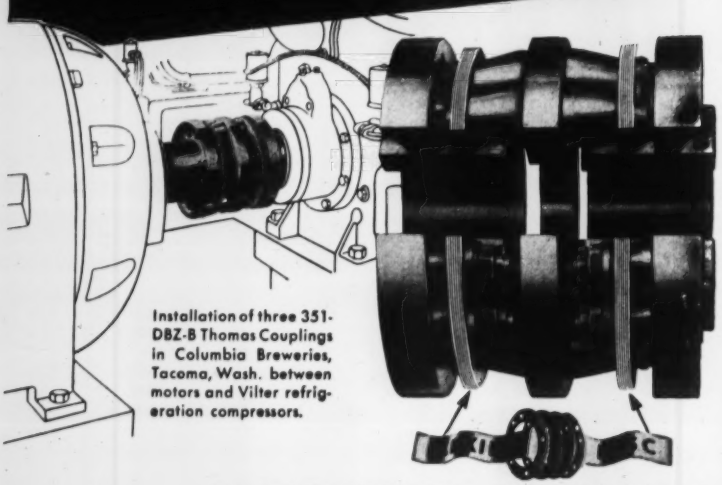
FOR MORE DATA CIRCLE REPLY CARD NO. 8

Wound-Rotor Motor

. . . rib-type enclosed

Slip rings, brush rigging, rotor, stator are in a single frame. At 1800 or slower it is standard or

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!



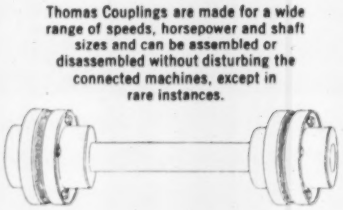
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.

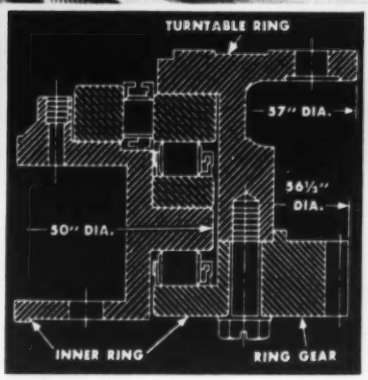
Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



THOMAS

Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.



Switch to SSW forged rings in bearing assembly adds to "ultra-accuracy" of naval gun director

Three forged rings which are the major parts of this bearing assembly for a naval gun director contribute to required "ultra-accuracy." By switching to Standard Steel forgings in two of these rings General Electric Company, Pittsfield, Mass., gets *all* these benefits.

1. The 57-in. O.D. turntable forged ring (formerly a casting), improves uniformity and stability of the metal, its machinability, and reduces required machining.
2. Proper heat treatment and precision machining give extreme smooth rotation on the roller bearings and accurate positioning without backlash.
3. Production has been simplified and speeded up and fabrication costs reduced.
4. The stationary 50-in. O.D. inner ring eliminated a weldment consisting of five rings cut from steel plate.
5. These rings cost less than cast rings in the quantities needed.

You, like General Electric, will benefit by using Standard Steel Works forgings. It'll be to your advantage to check how profitably SSW forged rings can replace weldments and castings. Why not write today for more information? Please address Dept. 8746, Standard Steel Works Division, Baldwin-Lima-Hamilton Corp., Burnham, Pennsylvania.

BALDWIN BLH LIMA-HAMILTON

Standard Steel Works Division
Burnham (Mifflin County), Pa.

BALDWIN-LIMA-HAMILTON
General Offices: Philadelphia 42, Pa. • Offices in Principal Cities

explosion-proof built.

Generally, it is used where low

starting current, high starting torque, smooth acceleration, jogging or variable adjustable speeds dictate a wound rotor motor; also where moist, dirty, corrosive or hazardous atmospheres require a totally enclosed motor. Allis-Chalmers Mfg. Co.

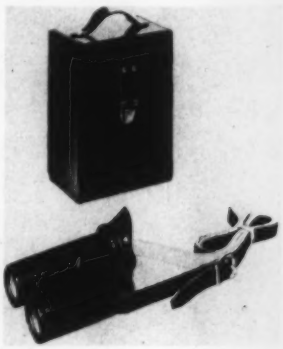
FOR MORE DATA CIRCLE REPLY CARD NO. 9

Smokescope

. . . aids in smoke control

This instrument can be used to determine whether fuel is being properly burned to gain full Btu advantage. With it, observers are able to view a standard reference disk, shaded to correspond with degrees of smoke density, against the background of a smoke plume.

Its advantages: It is easy to use; it is not necessary to refocus the eye in looking at smoke and



then chart; there are no variations in readings caused by intensity and incidence of light on the smoke; there are no variations in readings caused by differences in illumination of the chart. Mine Safety Appliances Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

Protective Film

. . . doesn't dull galvanizing

Proseal D-36 is said to give good resistance to the formation of white corrosion products without discoloring galvanized surfaces. Tested, these results were noticed: A minimum of zinc dilution, non-discoloration of surface; treated surfaces resist corrosion in the pact test.

A red liquid, it is packed in 12 gallon carboys. Promat Division, Poor & Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 11

Paint Spray Booth

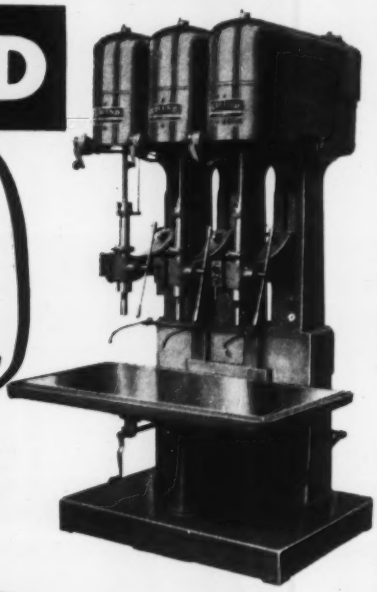
. . . new type baffle chamber

The Cleanaire Water Wash Booth provides a positive air cleaning action that prevents paint pigments and volatiles from reaching the exhaust stack or the outside of a building. It features a spray header mounted within two curved baffle plates, building up a violent spray turbulence.

Construction is panel type. The 18-gage steel has formed channel edges for extra strength. Four quick opening clamps make the interior easily accessible without tools. The efficiency of the air

EDLUND

Cuts Cost $1280. . . .* On One Job.



An EDLUND 2F Variable Speed Drilling and Tapping Machine Makes the difference

The Edlund 2F instant change variable speed feature lets you find correct drilling speed under practical on-the-job conditions. Saves valuable production time. No gear or belt changes necessary. Increases tool life by using correct drilling speed for each job requirement.

Standard or Special Models, 1 to 8 Spindles. 8", 12" or 15" overhang — capacity to 1¼". Available with Power Feed, Reversing Motor Tapper, Lead Screw Tapper, and Back Gears.

The job . . . drilling 7/16" hole 1½" deep in X1020 steel. The Edlund Variable Speed machine drilled 135 pieces per hour compared with 108 pieces per hour for standard machine production. The 25% increase in production reduced costs $1280.*

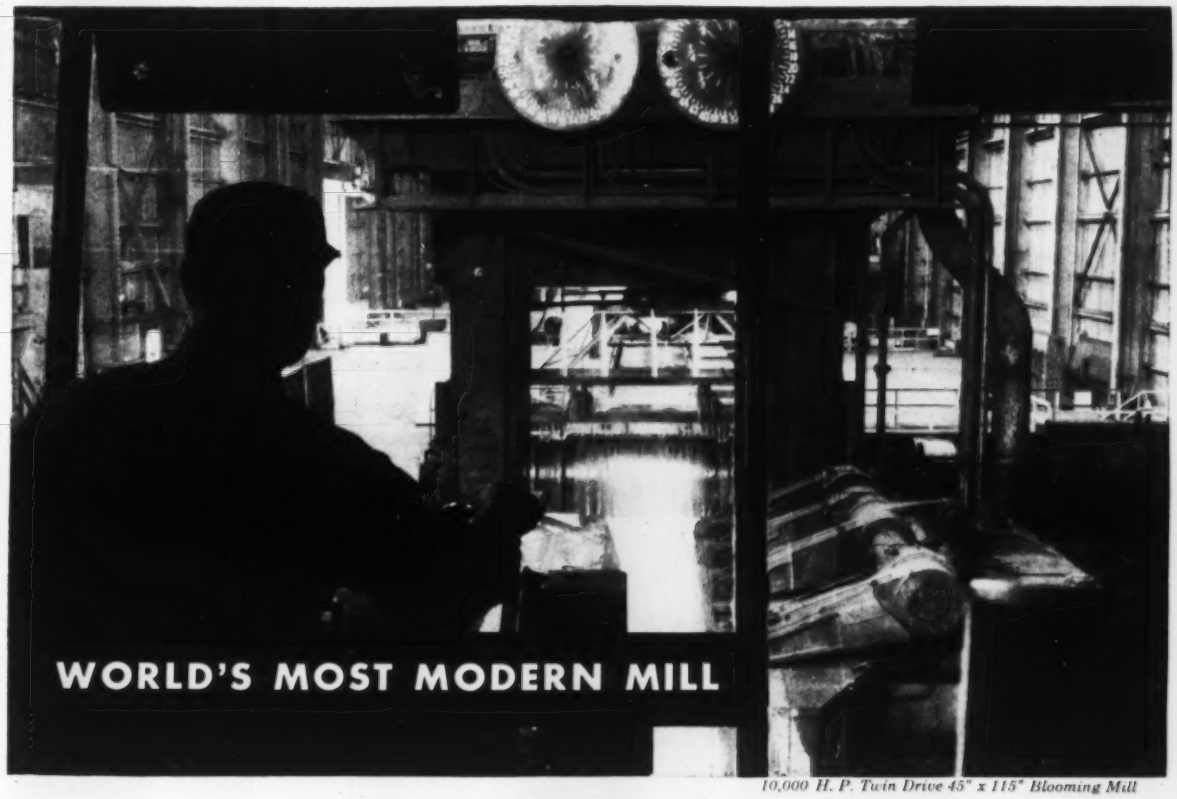
Write for Bulletin #140, a colorful, illustrated booklet describing the Edlund 2F. Specifications and quotations prepared promptly on request . . . with no obligation on your part.

*Case history folder #SF on request.

EDLUND MACHINERY COMPANY

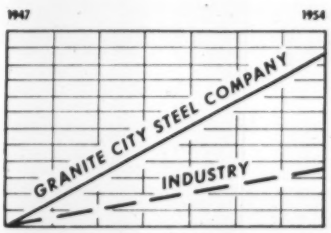
Cortland, New York Division of Bradley Edlund Corp. Affiliated with Precision Castings Co. Inc.

Edlund Representatives in Major Cities



10,000 H. P. Twin Drive 45" x 115" Blooming Mill

Four reasons why Granite City Steel is growing 3 times faster than the industry!



Percentage increase in steel ingot capacity

**Computed from AISI figures.*

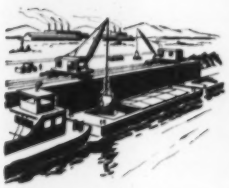
From 1947 to 1954, ingot capacity of the average U. S. steel mill increased 36%*. During the same period, ingot capacity of Granite City Steel Company expanded 108% — from 620,000 to 1,290,000 tons a year—or three times faster than the industry average!

Why? Because the demand for Granite City sheet steel dictated one of the most ambitious plant modernization and expansion programs ever undertaken. An $89 million investment went into blast furnaces, additional coke ovens, new open hearth furnaces . . . a new blooming mill, a new roughing mill . . . sharply stepped-up hot strip mill capacity . . . a new hot rolled shear line, a new cold strip mill.

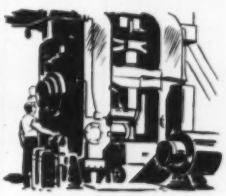
Result: the world's most modern, fully integrated mill, specializing in high quality flat-rolled steel for Middle America.

What does this growth mean to you? Fast, complete service and personal attention to every order, large or small. Granite City is equipped and eager to serve *you*. May we discuss the steel needs in your business, today?

AND HERE ARE THE OTHER THREE REASONS . . .



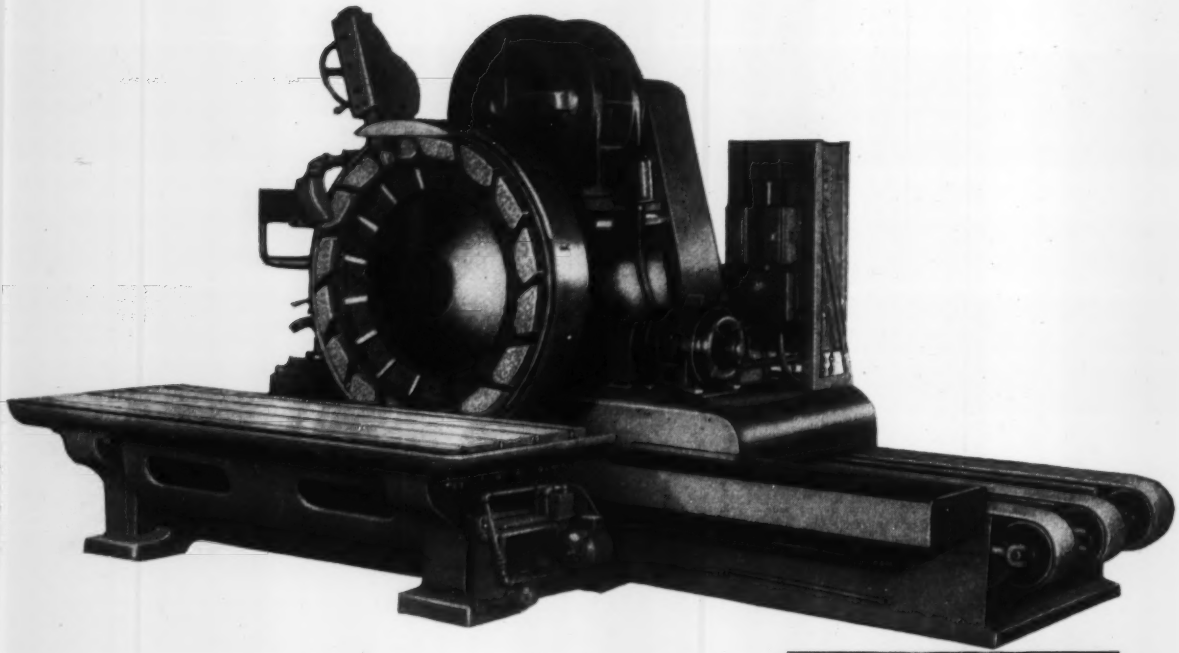
Low-cost transportation. Granite City Steel Company is strategically located in the heart of Middle America. Rail, truck and water transportation are available for quick, efficient, economical shipping.



Specialized "know how." For 76 years, flat-rolled steel has been the only product of Granite City Steel Company. This specialization — in training, personnel, equipment — is your guarantee of finest sheet steel available.

Personalized service. Granite City steelmen do not have the manufacturing and sales problems of a large, diversified line of products. This gives them more time to expedite your flat-rolled steel order promptly, properly.

GRANITE CITY STEEL CO.
GRANITE CITY, ILLINOIS
Sales Offices: St. Louis • Kansas City • Memphis • Minneapolis
Dallas • Houston • Tulsa
GRANITE CITY STEEL
GRANCO STEEL PRODUCTS CO.
A subsidiary of Granite City Steel Co



MATTISON TRAVELING WHEEL GRINDER FOR FAST FINISHING OF LONG OR LARGE PARTS

If your work consists of long or bulky parts, Mattison UK Traveling Wheel Grinders will finish them at a surprising rate of speed and accuracy and at very low cost. Large and awkward shaped pieces are frequently ground in a good deal less time than previous method. The part, no matter how large, is clamped in a stationary position and the grinding wheel passes across the surface to be finished. Amount of floor space needed is little more than half that required by traveling table machines of equal capacity. The operator's position on the carriage, together with the convenient grouping of all controls, makes for utmost grinding accuracy and speed regardless of the size of the job.

For further information, send for new free circular No. 844-2 RM covering this machine.

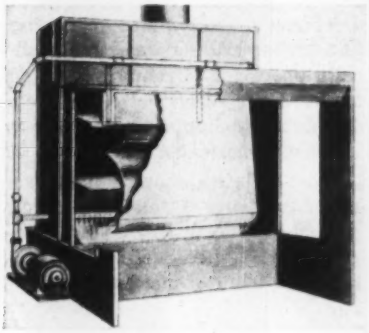
The operator rides the carriage of the UK Traveling Wheel Grinder. From this position he gets a safe unobstructed view of the grinding wheel at point of contact and can observe the work at all times.

Heavy work of practically any length can be rapidly ground to close tolerances with no more power required than for lighter work — the UK's table is always stationary. Picture shows end of 35′ base being ground.

MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS

and water cleaning action throughout the booth eliminates daily



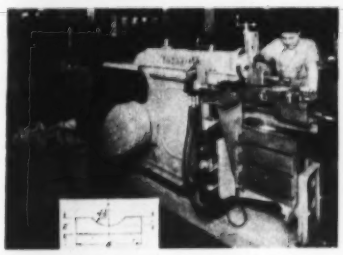
cleaning maintenance. Despatch Oven Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Shaper

. . . reduces machining time

The machine illustrated is a 24 in. heavy duty shaper equipped with Turchan automatic follower.



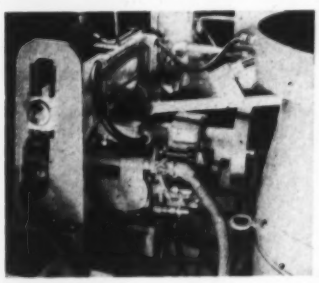
In one 20 minute floor to floor operation, the shaper accurately produces a radial bearing seat. Cincinnati Shaper Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

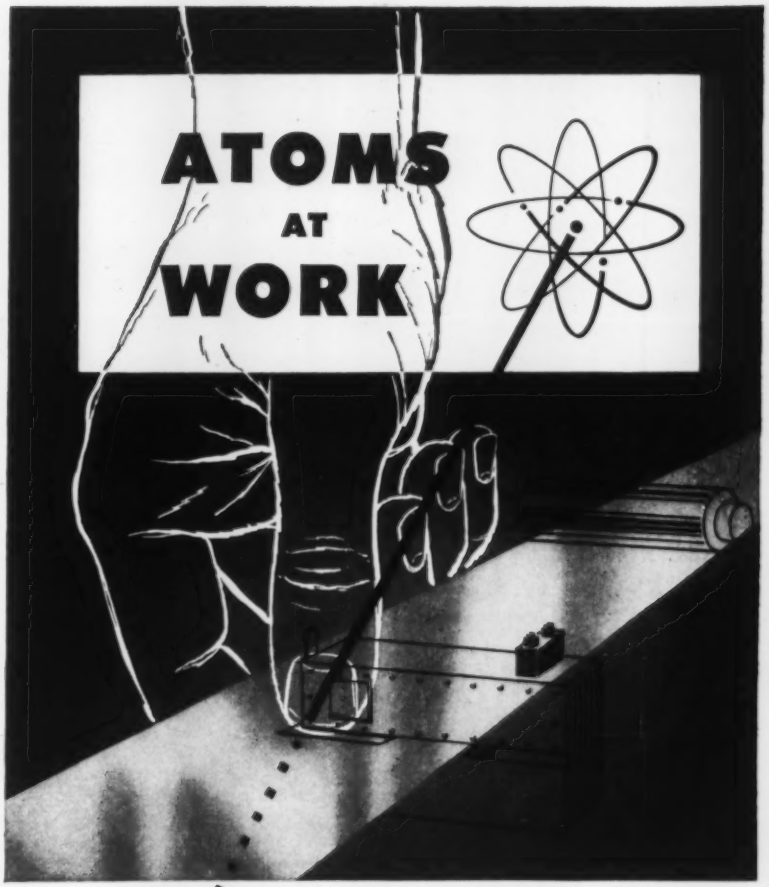
Hobbing Machine

. . . for high production

Tooled for cutting automatic transmission gears, the horizontal



type hobbing machine has a solid overarm for maximum rigidity. It operates through a combination of mechanical, hydraulic and electrical movements. Feed, index and



AT **WALLINGFORD STEEL**

At Wallingford, harnessed atoms precisely control steel thickness and assure important improvement in uniformity . . . ***automatically***. Here, radioactive isotopes of strontium or ruthenium demonstrate their superiority over mere man. Electronic continuous gages check strip, ranging down to .002" and to tolerances as close as .0001", without touching the metal to mark or otherwise affect it. ***Man alone is unable to control steel thickness so accurately . . . so fast!***

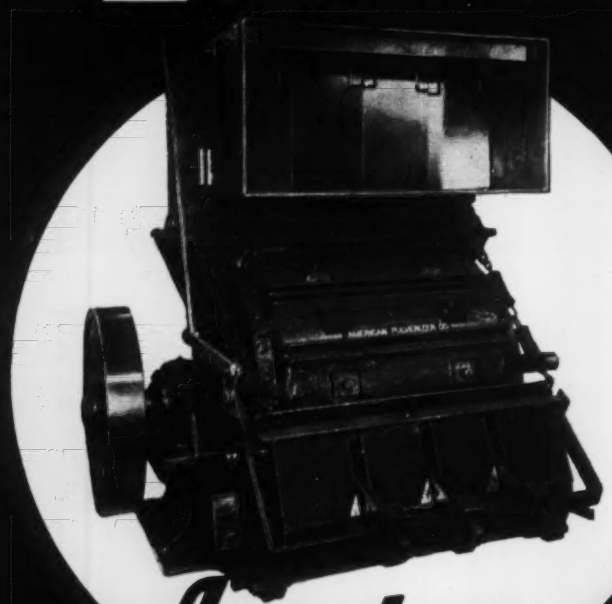
This practical application of atomic energy to improve our quality control is another reason why you can be confident that Wallingford will meet your most rigid specifications for stainless steel strip and tubing ***exactly*** . . . another reason for arranging to use Wallingford's ultra-modern facilities **soon.**

THE WALLINGFORD STEEL CO.
SINCE 1922
WALLINGFORD, CONN., U. S. A.

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP AND TUBING

CASH IN YOUR CHIPS

Change Metal Turnings Waste into More Profitable Shoveling CHIPS



American METAL TURNINGS CRUSHERS

No progressive, profit-conscious company—who produces 10 or more tons of metal turnings per month—can afford to ignore the profit potential of a modern chip salvage system . . . with an American Metal Turnings Crusher at the core.

American installation profits include: $4 more per ton for chips than for machine turnings; up to 50 gallons per ton in cutting oil recovery; 75% less storage; easier, faster handling.

How many profit dollars are you losing under present operations? If, for example, you're currently producing 20 tons of turnings a month . . .

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

240 Tons Metal Turnings per Year (20 tons/month at $4 extra per ton)	$ 960.00
6,000 Gallons Recovered Cutting Oil at 30¢/Gal. (50 gals. per ton x 240 tons = 12,000 gals. Half of this, 6,000 gals., can be credited to use of chips instead of turnings in reclamation)	$1,800.00
Estimated Savings in Manpower, Storage, Tools, Maintenance, Freight, etc.	$ 300.00
TOTAL GROSS PROFIT	$3,060.00

WRITE for Metal Turnings Crusher Bulletin.

American PULVERIZER COMPANY

Designers and Manufacturers of Ring Crushers and Pulverizers

1539 MACKLIND AVE. • ST. LOUIS 10, MO.

NEW PRODUCTS and equipment

hob speed are mechanically governed through a gear train and change gears. The work slide movements, automatic clamping and arbor-loading are hydraulically operated. Cycling and rapid traverse are electrically actuated. A vibratory hopper feed system loads automatically.

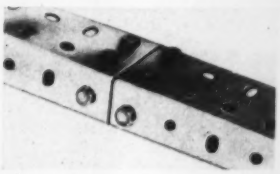
Close-up view shows solid overarm brace and automatic loading mechanism. Chute in center foreground feeds blanks to the hydraulic arbor-loading mechanism. Barber-Colman Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

Butt Joining

. . . of angle steel bars

In this photograph the two lengths of Structo angle are butt jointed. Not visible in the photograph is a 3-in. section of Structo



angle to which these two members are bolted. The bars also can be joined by overlapping one bar about 1½ in. over the other.

Three bolts can be used with this type joining, owing to the patented arrangement of round and elongated holes to insure a rigid joint. Colson Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 15

Lubricators

. . . for air-operated equipment

The outstanding feature of these lubricators is an easily adjusted

variable vane venturi, enabling one unit to meet the requirements of

announcing

THE FERRY CAP

countr-bor

SCREW

A NEW, REVOLUTIONARY DESIGN FOR SOCKET HEAD SCREW APPLICATIONS

OFFERING THESE NOTEWORTHY ADVANTAGES:

1. Takes standard 12-point socket wrench.
2. External wrenching instead of internal.
3. Stronger—more gripping surface.
4. Permits greater wrenching torque.

Packaged goods being readied for distributors

In brief—a quality product which will do everything required of socket head screws—and more. For all counterbore applications.

Wherever the Ferry Cap Countr-Bor Screw has been tried, users are enthusiastic—saying that these screws are a service man's dream and the best development in socket screws in recent years. They will help you lick tough assembly problems where socket screws are required.

We shall be glad to send samples, prices and complete information promptly upon request.

Ferry Cap Countr-Bor Screws
PATENT APPLIED FOR
MANUFACTURED SOLELY BY

THE FERRY CAP & SET SCREW COMPANY
2159 Scranton Road • Cleveland 13, Ohio

PUNCHES

DIES · RIVET SETS
COMPRESSION
RIVETER DIES

Made of highest standards and uniform quality thus insuring maximum service.

Since 1903

Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. A for New Catalog 54

GEO. F. MARCHANT COMPANY
1620-34 So. ROCKWELL STREET CHICAGO 8, ILLINOIS

YOUR BEST *Tip* IN CARTS

No. 119
Sterling
HEAVY-DUTY CART

If you're looking for a good tip for wheeling coal, scrap, chips, turnings or similar heavy materials, see these Sterling Heavy Duty Carts. Over and over again the "3-Point Landing" feature of this well-balanced cart will convince you it's the best buy for years of service. Can be furnished with pneumatics, as shown, or steel wheels . . . plain or roller bearings. Write for Catalog.

3 SIZES AVAILABLE:

No. 119	7½ cu. ft.
No. 120	9 cu. ft.
No. 121	11¼ cu. ft.

GOLDEN ANNIVERSARY
1904-1954
A HALF CENTURY OF PROGRESS

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Sterling
WHEELBARROWS

Look for this Mark of STERLING Quality

A 7846-3/5

NEW PRODUCTS and equipment

a wider range of operating conditions. They handle applications formerly requiring several sizes of lubricators.

The ⅜ in. size at 80 psi can be set for a low flow range of 5 to 9 cfm, a high range of 50 to 100 cfm or any intermediate range. The line includes 20 models in pipe sizes of ¼, ⅜, ½, ¾ and 1 in., with capacities of ½ pint, ¾ gallon and 4½ gallon and flow range from 5 to 250 cfm at 80 psi. C. A. Norgren Co.

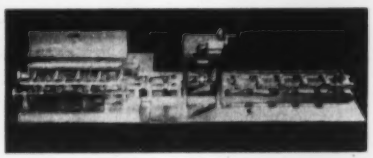
FOR MORE DATA CIRCLE REPLY CARD NO. 16

Billet, Grinding Line

. . . continuous

This multiple unit has been developed to eliminate the old hand swing frame grinding by substituting a dust free, high speed operation.

It includes: An automatic billet or slab feeder, grinder approach and run-out tables, grinders and an inspection table that mechanically rotates the product 360 degrees for the inspector and deposits it in a two position cradle car. York-Gillespie Mfg. Co.

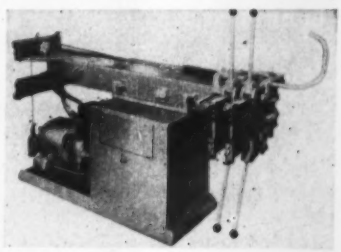


FOR MORE DATA CIRCLE REPLY CARD NO. 17

Two-Way Bending Machine

. . . works 1 in. O.D. tubing

Designed for clockwise and counter-clockwise operations, the Series 1400-A has an extended main spindle and double ways mounted on the top and bottom of stationary and swinging arms. The unitized head and top assembly is double-hinged to the base, per-



THE BURLINGTON LIARS' CLUB

SPINS A YARN FOR **BAKER'S MAGDOLITE**

Strike Three...You're Out

"They say they have big winds in Texas. Stuff! Compared to the windstorms we have in Virginia, they would be just a gentle breeze. Show you what I mean, here's an example. The other day we got us a windstorm, with plenty of thunder and lightning, the likes of which you've never seen. There was a big, old iron kettle, we used to scald hogs in, standing out in the yard. The wind picked up that kettle and blew it across the yard so fast that lightning struck at it three times and missed."

Guess Jupiter will have to send that lightning bolt back to the "bush leagues." It doesn't quite make major league material. If you are looking for "major league" dolomite, try BAKER'S MAGDOLITE – the original dead-burned dolomite. You'll discover that BAKER'S MAGDOLITE has chemical, physical and mineralogical composition which assures you of higher ingot uniformity with reduced maintenance costs. BAKER'S MAGDOLITE is better five ways . . . Composition, Preparation, Economy, Strength, Quality.

This tale was the Champion "whopper" at the 24th Annual Convention of the Burlington Liars' Club.

JEBCO PRODUCTS SINCE 1889

MAKERS OF BAKER'S MAGDOLITE

8-54

© The J. E. Baker Company

THE J. E. BAKER COMPANY

YORK, PENNSYLVANIA

Plants: Billmeyer, York, Pennsylvania—Millersville, Ohio

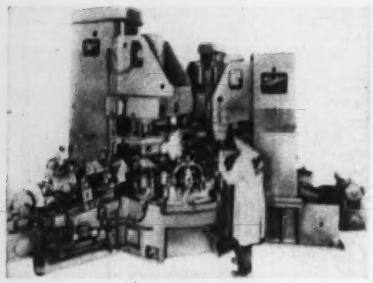
mitting the entire assembly to be turned over 180 degrees. This feature permits handling bending operations in either direction and interchanging tooling quickly. For the fastest changeover, secondary tooling may be mounted. Pines Engineering Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 18

Drilling, Tapping Machine

. . . performs 42 operations

It drills, reams, countersinks, rough-bores and taps all holes in flywheel housing. It is equipped with a 6 in. diameter index table



that has 5 stations and is power operated. Fixtures clamp and unclamp parts hydraulically.

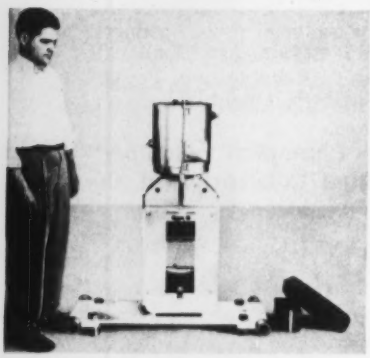
Complete interchangeability of parts is one of the standard features incorporated in the machine. Buhr Machine Tool Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 19

Billet Shear

. . . hydraulic pump powered

This Manco Hydraulic Guillotine shear has a free traveling mount.



As the shear blades penerate the moving billet, the pull of the billet moves the shear.

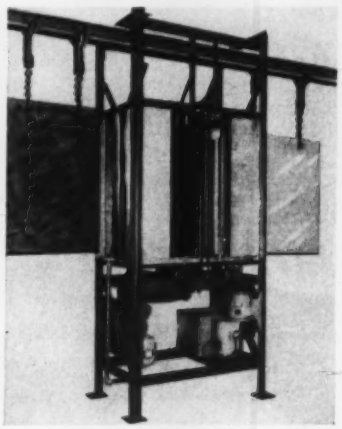
It delivers 125 tons cutting thrust to shear a 4½ in. steel billet in 10 seconds. Because the cutting action takes place while the billet is at about 1300° F, the complete Guillotine is jacketed for water cooling. Manco Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 20

Scrubbing Machine

. . . polishes before plating

The Cathode Plate Scrubber removes residue resulting from the buffing of cathode plates to be coated in the electrolytic deposition process. Metal plates, suspended by hooks, are carried through the scrubber by an over-



head monorail conveyor. A spray and cylindrical scrubbing brushes scour off residual material and a clear water rinse leaves plates clean.

Brushes are powered by two ¾ hp drip-proof motors—the 1800 rpm, 220 volt, three phase, 60 cycle type. The spiral coiled scrub brushes are 47 in. long and have stainless steel backing. The fill consists of 0.007 in. of crimped black nylon. Machine Division, Fuller Brush Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 21

Spray Type Cleaner

. . . multi-phase

This cleaner combines solvent, wetting agent and alkaline. It is especially effective on steel. It removes shop and mill oils, drawing compounds and heavy greases. Vantrol 5618 also has the added value of rust protection. It will not coat a machine with the oil removed from the parts, will not clog nozzles or require severe maintenance.

Nontoxic, it will not irritate operator's hands under normal conditions. It is not inflammable. Van Straaten Chemical Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 22

Fork Lift Trucks

. . . gasoline powered

Available in 3000, 4000 and 6000 lb capacity, the FG line will com-

plement recently introduced automatic transmission models and Yardloader outdoor trucks. They have a 130-inch lift, short turning radius and low initial cost.

Power is provided by Hercules heavy duty industrial engines. The transmission features an 11-inch Rockford clutch rated at twice the torque capacity of the engine. With two speeds in forward and reverse, the drive axle has bevel gear reduction and an automotive type differential. There is a further gear reduction in the wheels. Baker-Raulang Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 23

Gear Testing Fixture

. . . quick change, pitch line

Designed for use on a Rockwell Superficial Hardness Tester with a special gooseneck type Brale, this device accommodates different size in laboratory or production operations.

As illustrated, the gear is placed on an inclined plane mounted on a sliding plate. The plate is moved toward a positioning anvil, which is designed to compensate for diametrical pitch. The elevating screw is raised to bring the Brale into contact with the gear

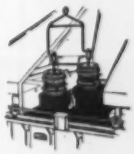
why it pays to specify

TORRINGTON

Spherical Roller Bearings

Uniform, close control of precision-ground contact surfaces—for even load distribution and maximum bearing life.

Accurate geometrical conformity between races and rollers—for ultimate load carrying capacity and performance.



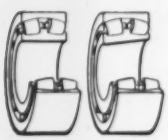
Races and rollers heat treated according to the most advanced metallurgical procedures—for maximum durability.

Individual one-piece cage for each path of rollers—assures freedom of operation.

Integral flange on inner race—to give radial stability and positioning for thrust loads—both essential to satisfactory performance.

Self-aligning—for continuous, free-rolling service under shock loads and at sustained speeds.

Unit assembly—for easy, economical handling.



Available from stock with either straight or tapered bore—for shaft or adapter mounting.

These are advantages that give you long, efficient, low-maintenance service in the toughest heavy-duty application. **To get maximum value for your bearing dollar, *specify TORRINGTON Spherical Roller Bearings.***

THE TORRINGTON COMPANY

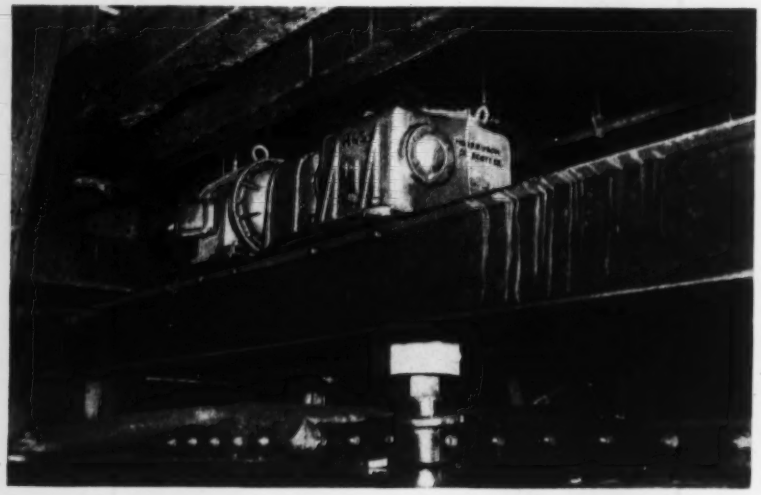
South Bend 21, Ind. • Torrington, Conn.

TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

NO OIL LEAKAGE INTO PRODUCT

When H & S
Reducers Drive Chemical Agitator Tanks



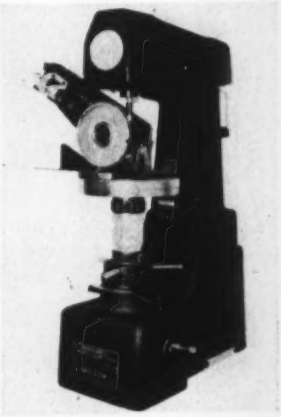
The H&SWV Worm Gear Speed Reducer, with its original annular baffle surrounding the shaft and extending upward into a recess in the gear hub (well above the height of the oil level), *eliminates the possibility of oil leakage* down the low speed shaft. One example is illustrated above in a National Aniline plant. This dependable reducer finds wide use in driving agitators, mixers and assembly conveyors; for operating large valves in power plants, chemical plants and hydraulic stations, especially where remote control is used . . . also in applying power to jacks, tilting hoppers, car pullers, capstans, machine tools, and other equipment where vertical drive is indicated . . . up or down.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio

Send note on Company Letterhead for 488-Page Catalog 49

NEW PRODUCTS and equipment

tooth. A lock screw on the base plate, used to lock the inclined plane in position, is tightened. A cam-type adjusting clamp slides down; the gear is locked in posi-



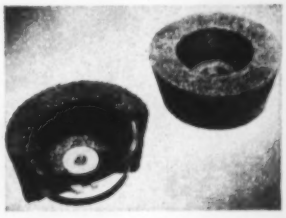
tion; and the Brale brought into contact with the gear. American Chain & Cable Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO 24

Grinding Wheel

. . . for portable grinders

The two rings seen in the photo are embedded directly in the usable portion of the wheel. They are Grind-away Safety Rings and have a tensile strength greater than steel, although they abrade



away during the normal cutting of the wheel without interference to the grinding action. This makes it possible to reinforce the wheel where reinforcement is needed.

Tests by users show that cracked wheels have been run up to 20 per cent above normal operating speed without the wheel exploding. This safety feature has been extended to straight wheels and type 5, 6 and 11 cups for portable grinders. Colonial Abrasive Products Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 25

FREE LITERATURE

Catalogs and Clip Sheets

Use these reply cards to bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Air Tools

Rotor Tool Co. covers its air tools for the foundry, steel mill, production line and assembly plant —Catalog 38A, 55 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 26

Splicers

E. W. Bliss Co. has a bulletin that describes its line of Weld-A-Matic Splicers—Bulletin 43, 4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 27

Gear Set Selection

Michigan Tool Co.'s Cone Gears Division offers selection and ordering information, worm dimensions, gear and spider standards, tool charts and horsepower ratings on its gear sets—Bulletin 700, 16 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 28

Storage Equipment

Precision Equipment Co. offers a catalog describing items added to its line of lockers, ladders, storage and maintenance equipment—24 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 29

Extrusions

Precision Extrusions describes the aluminum extrusion process. It is of help to those who select extrusions—11 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO 30

Expanded Metal Gratings

Penn Metal Co. Inc. has a folder on its gratings of expanded steel plate. Tables on sizes, weights and dimensions are included—File No. 14-R, 4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Hand, Foot Valves

Ross Operating Valve Co. covers design advancements in its 600 and 880 series of hand and foot valves —Bulletin 303-B, 20 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 32

Gray Iron

Gray Iron Founders' Society Inc. has released a manual on the heat treatment of gray iron written in non-technical language—123 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 33

Broaching Fixtures

National Broach & Machine Co.'s Red Ring, self contained, air powered bench type broaching fixtures are discussed—12 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 34

Wire Rope

Macwhyte Co. has a catalog of interest to those who handle, use and deal in wire rope.

FOR A FREE COPY CIRCLE REPLY CARD NO. 35

Air Compressors

Curtis Mfg. Co.'s Pneumatic Machinery Division offers a catalog on its new line of air compressors —Catalog C-100, 28 pages.

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Alloys

Cerro de Pasco Corp.'s "Cerro Alloys in the Foundry and Pattern Shop" has been revised, incorporating several new ideas—12 pages.

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Electric Hoists

R. G. LeTourneau Inc. covers the heavy duty construction and operational features of a line of electric hoists—6 pages.

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Fabric Bearings

Gatke Corp. illustrates applications and describes the properties of moulded fabric bearings, wear plates and other parts—32 pages.

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Data Processing

Consolidated Engineering Corp.'s "Data Processing Instruments" furnishes information on its line of data-processing equipment, ranging

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from minature transducers to entire instrumentation systems—Bulletin CEC-1301, 12 pages.

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Pressure Filters

Industrial Filter & Pump Mfg. Co. has revised its catalog on its line of vertical leaf pressure filters used for solution clarification—8 pages.

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Strapping

A. J. Gerrard & Co. has issued a brochure describing its line of Bulkbinder heavy duty strapping, strapping tools and accessories—6 pages.

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Measuring Unit

Minneapolis-Honeywell Regulator Co. gives technical details and specifications of the Colorede computing flicker photometer with Brown ElectroniK instrumentation—Data Sheet 10.10-5, 4 pages.

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Cast Monel

International Nickel Co. Inc. describes the engineering properties of cast Monel—7 pages.

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Die Sets

Lempco Products Inc. covers more than 300 sizes of ball bearing precision and super precision die sets—Bulletin SS, 192 pages.

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Hot Spray

Spee-Flo Co. has published "Why Hot Spray?" which answers many questions on the subject—Booklet Q-300, 14 pages.

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Stainless Steel Piping

Babcock & Wilcox Co. offers data for engineers and designers dealing with problems involving stainless piping—Bulletin TB 356, 6 pages.

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Gage Blocks

Jansson Gage Co. presents its extended line of extreme-tolerance gage block sets, sine bars, trisquares and accessory sets—19 pages.

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Joints

Curtis Universal Joint Co.'s catalog contains engineering and purchasing data for all stock sizes. It is illustrated with photos, graphs and charts.

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Cranes

Euclid Crane & Hoist Co. covers in photo form types of the cranes and hoists—25 pages.

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Mylar

E. I. Du Pont de Nemours & Co. offers two technical reports on mylar polyester film. One covers the physical, chemical and electrical properties, the other is on adhesives developed for bonding mylar to other materials—TR-1 and TR-2.

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EDITORIAL REPRINTS:

Continuous Casting

Steelmen are waiting for cost data on the first commercial caster. If they're favorable, there will be fewer steps to finished steel (p. 88).

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Foreign Machinery Markets

Canada and Latin America are growth markets. This year equipment exports may dip below 1953's record $3 billion, but they'll still be good (p. 56).

FOR A FREE COPY CIRCLE REPLY CARD NO. 53

Conveying Equipment

What's new in conveyors (p. 49)? This type equipment goes hand-in-hand with automation and cost saving. So, manufacturers of the apparatus are optimistic about sales this year and next.

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Metal Powder Pressing

Baldwin-Lima-Hamilton believes the presses themselves hold back full utilization of the powder pressing process. The company bases its design on the findings of a user survey (p. 90).

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Market Outlook

DO YOUR steel shopping early—early enough to get what you want when you want it.

STRETCH-OUT— Delivery dates on some products, particularly the light flat-rolled, are becoming farther and farther extended as orders increase. Republic Steel Corp. for the second consecutive week lengthened its average delivery time on cold-rolled carbon steel sheets from its Warren, O., mill by three weeks. It takes 10 to 11 weeks to get that product from Warren; a week earlier it took 7 to 8 weeks, the week before that, 4 to 5 weeks. In two weeks deliveries have been extended six weeks. Eleven-week delivery means delivery in January. Republic can quote a little faster delivery on cold-rolled sheets out of its big mill in Cleveland. Average there is 6 to 7 weeks, but that's an increase of two weeks over what it was a week ago.

EQUAL TO THE HIGH— As the order flow expands, ingot output is being stepped up. In the week ended Oct. 31 it equaled the year's high —75.5 per cent of capacity—set in January. To reach 75.5 per cent, the rate rose 0.5 point over the preceding week and marked the second consecutive week of increase.

ABOVE AVERAGE— Some steel producers and some steelmaking districts are far above the national average of 75.5 per cent. St. Louis was at 91 per cent and Cleveland 87.5 per cent.

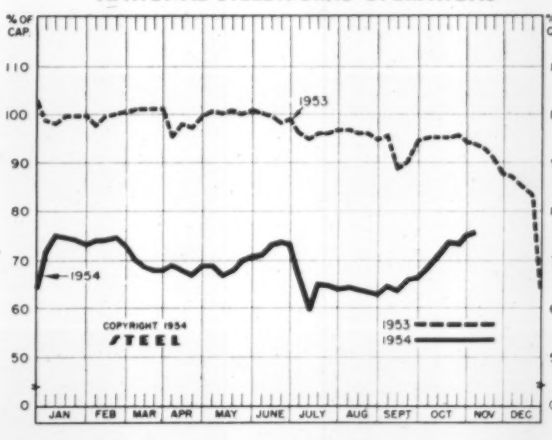
LESS ROOM TO BARGAIN— As deliveries of light flat-rolled steel stretch out, consumers are less able than they were to bargain on shipment. This may make them increasingly inventory conscious. Richard F. Sentner, assistant executive vice president—commercial, United States Steel Corp., Pittsburgh, says that inventories have reached such a low level that many steel consumers are operating hand-to-mouth. "It is clear," Mr. Sentner declares, "that the next major change in the level of steel inventories will be upward." Consumer resistance to carrying heavier stocks may well disappear at the slightest increase in their own business or at the slightest sign that steel markets are tightening under the stimulus of better business in other steel consuming industries, Mr. Sentner believes.

CONCURS— Adm. Ben Moreell, chairman, Jones & Laughlin Steel Corp., Pittsburgh, holds views similar to those of Mr. Sentner. Admiral Moreell says, "Inventories can only go up now."

SCRAP OVER SCRAP— The United States is not the only place where steel demand and production are picking up. It's happening abroad, boosting the price of scrap, one of the ingredients of steel. STEEL's price composite on steelmaking grades of scrap for the week ended Nov. 3 climbed to $33.67 a gross ton, highest since the week ended Dec. 3, 1953. This is a $1 jump over the week ended Oct. 27. The substantial flow of scrap from this country is fanning a fiery fight. Domestic users are opposed to exports. Sellers want to continue them. They contend they must export to survive, now that domestic users are not taking as much scrap as they did last year. Both sides have taken their problem to Washington.

Prices of finished steel remains unchanged. STEEL's composite is $117.95 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Nov. 7	Change	Same Week 1953	Same Week 1952
Pittsburgh	73	0*	93	105
Chicago	79.5	+ 0.5*	100.5	111.5
Mid-Atlantic	70	+ 1	96	99
Youngstown	74	+ 1.5	97	106
Wheeling	81	+ 1	98	99.5
Cleveland	87.5	— 0.5*	100.5	110
Buffalo	90	+ 2.5	106.5	106
Birmingham	64	— 7	96.5	105.5
New England	59	0	80	91
Cincinnati	76.5	+ 7	67	96
St. Louis	91	+ 7	89.5	98
Detroit	80	0	97.5	106
Western	86	+ 5	104	106.5
National Rate	75.5	+ 0.5	93.5	106

INGOT PRODUCTION‡

	Week Ended Nov. 7	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	112.3†	110.6	105.3	130.5
NET TONS (In thousands)	1,804†	1,776	1,692	2,096

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 37 Technical Outlook—p. 87

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Nov. 2 1954	Oct. 26 1954	Month Ago	Oct. Average
(1947-1949=100)	144.7	144.7	144.7	144.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Nov. 2

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.500
Wheels, freight car, 33 in. (per wheel)	48.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.430
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	8.775
Bars, H.R., stainless, 303 (lb)	0.418
Bars, H.R., carbon	5.000
Bars, reinforcing	5.050
Bars, C.F., carbon	8.160
Bars, C.F., alloy	11.275
Bars, C.F., stainless, 302 (lb)	0.433
Sheets, H.R., carbon	4.880
Sheets, C.R., carbon	5.871
Sheets, galvanized	7.220
Sheets, C.R., stainless, 302 (lb)	0.548
Sheets, electrical	$9.350
Strip, C.R., carbon	7.507
Strip, C.R., stainless, 430 (lb)	0.415
Strip, H.R., carbon	5.125
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv., buttweld (100 ft)	18.605
Pipe, line (100 ft)	146.804
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.875
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	8.533
Tin plate, electrolytic, 0.25 lb	7.233
Black plate, can making quality	6.333
Wire, drawn, carbon	7.938
Wire, drawn, stainless, 430 (lb)	0.545
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.109
Woven wire fence (20-rod roll)	16.815

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Nov. 3 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.53	194.53	194.53	189.38	152.52
Index in cents per lb.	5.270	5.270	5.270	5.130	4.132

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.95	$117.95	$117.95	$115.18	$91.64
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.10
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	33.67	32.67	32.00	35.00	28.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Nov. 3 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.35
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.35
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	5.302	3.83
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	3.95-4.00
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.25
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.25
Shapes, deld., Philadelphia	4.53	4.53	4.53	4.38	3.50
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.40
Plates, Chicago	4.225	4.225	4.225	4.10	3.40
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.50
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.40
Plates, Claymont, Del.	4.225	4.225	4.225	4.55	3.50
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.25
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.025	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45-5.95	4.00
Strip, C.R., Chicago	6.00	6.00	6.00	5.70	4.00-4.15
Strip, C.R., Detroit	5.60-.90	5.60-.90	5.60-.90	5.45-6.05	4.20-.25
Wire, Basic, Pitts.	5.75	5.75	5.75	5.475-5.525	4.15
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.35-6.55	5.15
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$61.00
Wire rods, ¼-⅝" Pitts.	4.675	4.675	4.675	4.525	3.40
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	60.75	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	50.16	50.16	50.16	61.25	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	59.88	39.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.62	60.43	46.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$34.50	$32.50	$32.50	$36.50	$29.50
No. 1 Heavy Melt, E. Pa.	33.50	32.50	30.50	35.00	25.00
No. 1 Heavy Melt, Chicago	33.00	33.00	33.00	33.50	29.50
No. 1 Heavy Melt, Valley	35.50	35.50	35.00	35.50	32.75
No. 1 Heavy Melt, Cleve.	33.50	32.50	32.00	33.50	30.25
No. 1 Heavy Melt, Buffalo	30.50	30.50	30.50	34.50	28.25
Rails, Rerolling, Chicago	54.50	54.50	51.50	45.00	44.50
No. 1 Cast, Chicago	39.50	39.50	39.50	33.50	42.50
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$13.75	$13.75	$13.75	$14.75	$13.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	16.75	15.75
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

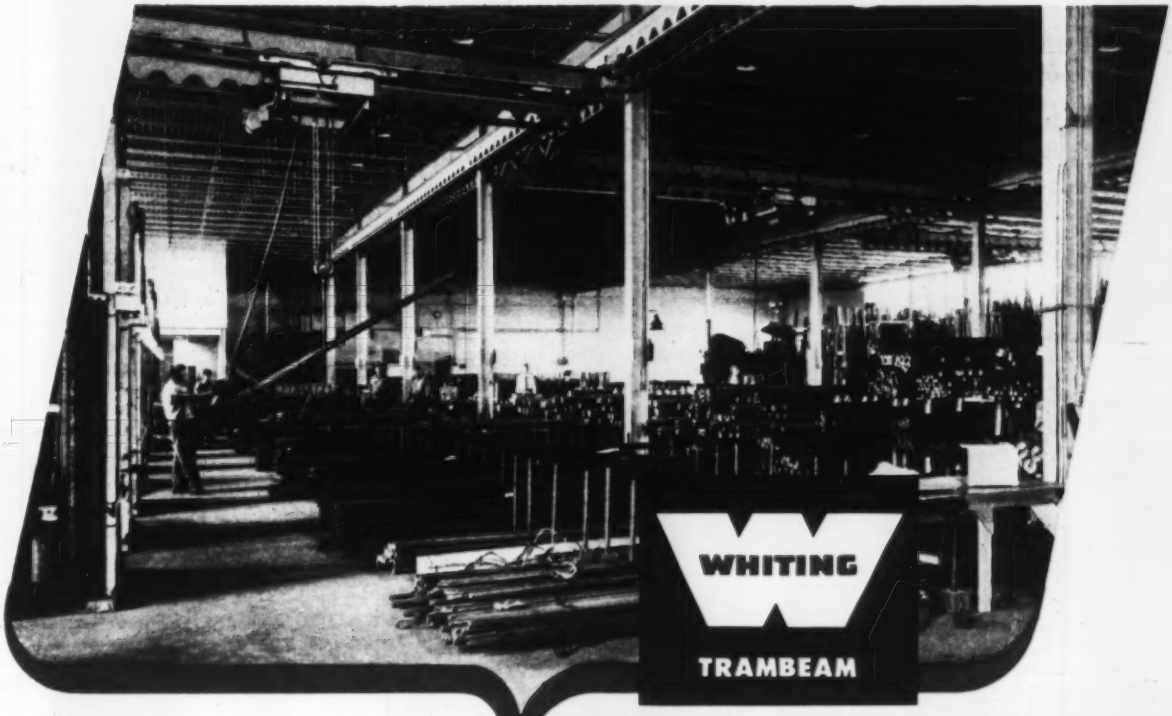
Daily Nonferrous Price Record

	Price Nov. 3	Last Change	Previous Price	Oct. Avg.	Sept. Avg.	Nov. 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	30.000	30.000	29.606
Lead	14.80	Oct. 4	14.55	14.775	14.400	13.300
Zinc	11.50	Sept. 3	11.00	11.500	11.900	10.000
Tin	92.25	Nov. 3	92.375	93.110	93.545	81.096
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	22.20	Aug. 5, 1954	21.50	22.200	22.200	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, commond grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+ %, deld.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



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Nonferrous Metals

Demand for nonferrous metals picks up, but prices likely will hold steady. Heavier production of civilian durable goods and a rise in defense orders spark upturn

Nonferrous Metal Prices, Pages 146 & 147

STEPPED-UP buying is appearing in nonferrous metals.

Not all segments of the market are gaining at the same rate, but a definite over-all trend upwards is being set. It promises to continue through the first quarter of 1955.

Signposts—Prices are not likely to gain with the increased ordering. Competition in supplying finished products leaves little leeway for upswings, while metal production costs are too close to selling prices to allow lower prices.

This anticipated stability will lend confidence to forward buying and replenishment of stocks. More and more industry men believe the inventory adjustment rounded bottom two months ago. They're taking in more raw materials, though turnover velocity has been stepped up to minimize investment in idle inventory.

Surveys — Heavier production of civilian durable goods is one factor behind the rise. An increase in government defense orders is another. New orders booked by manufacturers in September showed greatest strength since the summer of 1953.

Order backlogs registered their first gain in two years as new orders outstripped steadily rising shipments. Automotive and appliance output is sparking much of the rise.

No Flash—September pickup was no "flash in the pan," National Association of Purchasing Agents reports after an October survey of members. The survey hints the trend will continue for the balance of the year at least. Order increases topped declines by more than four to one, the October report indicates—46 per cent of buyers polled reported order increases and 41 per cent production gains.

Buyers are still within what NAPA calls a conservative commitment range. Accent is on 30 to 60 days, with about the same number of purchasing agents ordering under 30 days and over 90 days. Buying optimism shown this month is even more heartening to metal suppliers.

Help for Copper Users

To date, 51,500 tons of copper have been committed by the government to pull fabricators through a year-end pinch resulting from mine and smelter strikes. An additional 25,000 tons of U. S. controlled copper was made available last week by Office of Defense Mobilization by deferring deliveries destined for stockpile. The copper is in the form of cathodes rather than fabricators' shapes. Copper users, while still feeling the squeeze, believe they can keep going satisfactorily until new supplies catch up with rising demand.

STEEL's Metal Price Averages for Oct., 1954

(Cents per pound)

Electrolytic Copper, del. Conn.	30.000
Lead, St. Louis	14.775
Prime Western Zinc, E. St. Louis	11.500
Straits Tin, New York	93.110
Primary Aluminum Ingots, del.	22.200
Magnesium Freeport, Tex.	27.00
Nickel, f.o.b. refinery	60.000

New Process for Aluminum

New electrolytic oxide coating process for aluminum promises to put the light metal into competition for wear parts, such as gears, competing with manganese bronze and steel. Patent rights have been assigned to Aluminum Co. of America. The process calls for a 15 per cent sulphuric acid bath, which is refrigerated to 30° F; current flow is about 20 amps per square foot. A coating 1/500-in. thick is made in 90 minutes.

Titanium Mill Output Rises

Third-quarter titanium mill products output shot sharply over the second-quarter total, a newly initiated government report indicates. Business & Defense Services Administration figures show third-quarter turnout at 691,123 lb, topping the second quarter by 134,451 lb. First-quarter total shows an output of 579,939 lb. For a metal that was first produced commercially six years ago, anticipated output of 6000 tons of ingot titanium in 1954 is a measure of the metal's growing importance. Announced expansion plans to date call for facilities to process 37,500 tons of titanium ingot by the end of 1956. In a parallel development, National Lead Co. President Joseph A. Martino said his company's faith in titanium's future is shown by setting sights for much higher production goals than the current 10 tons a day.

Market Memos

- An intra-governmental squabble is brewing in Canada over granting of hydroelectric rights to Kaiser Aluminum & Chemical Corp. on the Columbia river in British Columbia.

- Lead-zinc markets continue to get their monthly boost as the government asked bids for the two metals for the sixth consecutive month. Deliveries have averaged some 15,000 tons of zinc and 9000 tons of lead monthly, less than half the authorized purchase rate.

- Ribbed embossed aluminum sheet for such uses as bus seat backs and door kick plates is available from Kaiser Aluminum & Chemical Corp. Gages from 0.010 to 0.064 are supplied as both flat and coiled sheet in widths of 48 in. and tempers from O to H-394. Alloys are 1100, 3003, 5050, and 5092.

- First nickel source in the U. S. may be in Minnesota if prospecting by International Nickel Co. is successful. Site is the Superior National Forest, for which Inco has held prospecting permits. The company has agreed to terms for a possible mineral lease with the Interior department.

- Market for aluminum has risen considerably during recent months, with every prospect for continued strength the balance of the year, says Henry J. Kaiser.

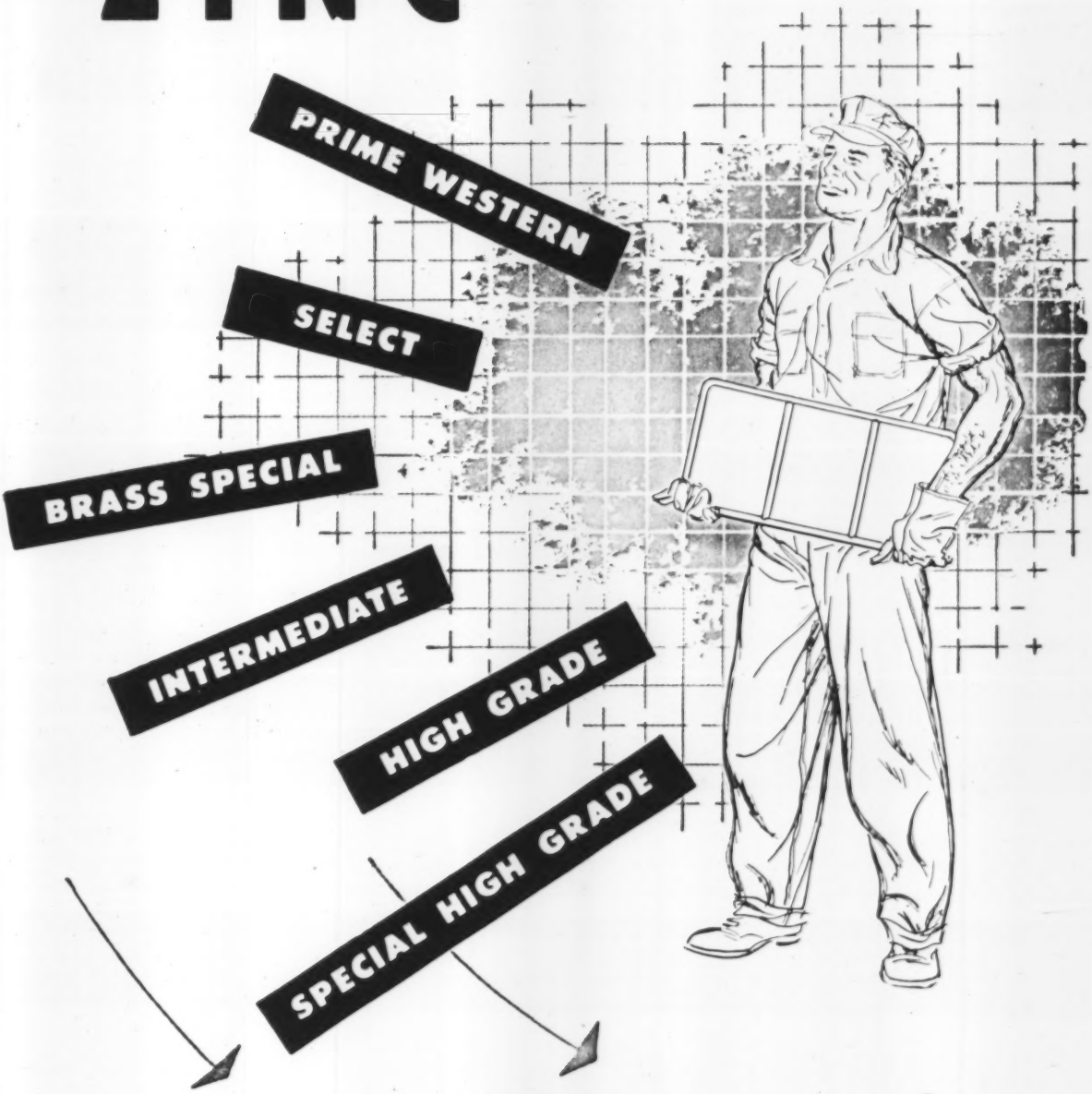
- Die casters' orders for special high grade zinc to meet heavy automotive requirements may set new highs. Strong demand for galvanized steel sheets is another bright spot for zinc sellers.

- Production is expected to begin early next year at Lithium Corp.'s new $7-million plant at Bessemer City, N. C.

- Nonferrous scrap markets have drifted into inactivity, normal aftermath of the frenzied selling during the copper squeeze.

SLAB ZINC

every grade of ZINC for urgent military and civilian requirements



AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 24; No. 43, 5% Si, 23.8; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 26.3; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 deld. Conn. Valley, 30.00 deld. Midwest; Lake 30.00 deld.; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $320-$320-$325, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 92.25, prompt 92.125.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $4.72; grade A-2 (0.5% Fe max) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb, f.o.b. shipping point; less than 1000 lb $5.10 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 15.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 21.25-21.75; No. 12 foundry alloy (No. 2 grade) 20.25-20.75; 5% silicon alloy, 0.60 Cu max., 23.75-24.00; 13 alloy, 0.60 Cu max., 23.75-24.00; 195 alloy 21.75-22.75; 108 alloy 20.75-21.25; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00; grade 2, 20.50-21.00; grade 3, 19.50-20.00; grade 4, 18.50-19.00.

Brass Ingot: Red Brass, No. 115, 29.50; tin bronze No. 225, 41.00; No. 245, 34.75; high-leaded tin bronze, No. 305, 34.00; No. 1 yellow, No. 405, 25.25; manganese bronze No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy.) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb. 36.53; l.c.l. 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $20.00 per cwt; pipe, full coils $20.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $6; hot-rolled and forged bars, $6.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM*

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	62.5	61.0	...	...
0.156-0.172	52.9	51.3	...	...
0.188	52.9	51.3	...	65.8
0.219-0.234	50.1	48.5	...	...
0.250-0.281	50.1	48.5	...	62.7
0.313	50.1	48.5	...	59.8
Cold-finished				
0.375-0.547	48.9	46.5	58.8	56.2
0.563-0.688	48.9	46.5	55.9	52.7
0.750-1.000	47.7	45.3	51.1	49.6
1.063	47.7	45.3	...	47.9
1.125-1.500	45.9	43.6	49.4	47.9
Rolled				
1.563	44.7	42.4	...	...
1.625-2.000	44.1	41.8	...	46.2
2.125-2.500	43.0	40.7	...	...
2.563-3.375	41.7	39.5	...	...

ALUMINUM*

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	38.6
0.076-0.061	12-48	36.7	33.8	38.8
0.060-0.048	12-48	37.2	34.1	39.2
0.047-0.038	12-48	37.7	34.6	39.6
0.037-0.030	12-48	38.1	35.0	40.3
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	90.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM*

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.7	38.9
5050-F	34.7	38.9
3004-F	35.7	40.6
5052-F	37.4	42.4
6061-T6	38.6	43.0
2024-T4*	40.8	46.9
7075-T6*	48.6	55.2

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM*

Forging Stock: Round, Class 1, 46.8-36.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 52.6-40 in. random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.70	2	$ 48.30
1	24.75	4	132.90
1¼	23.50	6	238.35
1½	40.05	8	358.60

*Alloy designations are standard for use on and after Oct. 1, 1954. To relate them to designations used prior to that time, see STEEL, Aug. 9, 1954, p. 95.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in., 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 28 clippings 14.00; low copper clippings 14.00; mixed clippings 12.00; old sheet 11.00; borings and turnings 7.00; pistons and struts 8.50; crankcases 11.00; industrial castings 11.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.95c	....	48.44	26.000	26.000	25.250
Yellow Brass	41.72	34.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	50.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire, No. 1 25.00; No. 2 copper 24.00; light copper 22.00; No. 1 composition red brass 20.00; No. 1 composition turnings 19.50; mixed brass turnings 14.00; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 12.50; heavy yellow brass 15.50; new brass rod ends 16.00; auto radiators, unsweated 17.00; cocks and faucets 17.00; brass pipe 17.50.

Lead: Heavy 11.75-12.00; battery plate 6.25-6.50; linotype and stereotype 13.75-14.00; electrotype 12.00-12.50; mixed babbitt 12.50-13.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 5.00-5.25; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 16.00-16.25; 51S, 52S clippings 16.00-16.25; 14S, 17S, 24S clippings 15.25-15.50; mixed clipping 14.75-15.00; old sheet 14.00-14.25; old cast 14.00-14.25; clean old cable, free of steel 16.00-16.25; borings and turnings 14.25-14.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 28.00; No. 2 copper 26.50; light copper 25.00; refinery brass (60% copper) per dry copper content 24.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 27.75; No. 2 copper 26.25; light copper 24.75; No. 1 composition borings 22.75; No. 1 composition solids 23.00; heavy yellow brass solids 18.00; yellow brass turnings 17.00; radiators 18.75.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 5000-10,000 lb; electrodeposited 39.78, cast 42.04, 2000-5000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.05; 200-499 lb $1.09; 500-999 lb $1.085; 1000 lb or more $1.08.

Zinc: Bar 20.00, bar or flat top 19.00 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb. in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 70.6; 100-600 lb 56.3; 700-1900 lb 53.9; 2000-9900 lb 52.1; 10,000 lb or more 51.

Stannous Chloride: (Anhydrous): Less than 50 lb $1.564; 50 lb $1.224; 100-300 lb $1.074; 400-900 lb $1.049; 100-1900 lb $1.025; 2000-4900 lb 98.8; 5000-19,000 lb 92.7; 20,000 lb and over 86.6.

Stannous Sulphate: Less than 5 lb $1.264; 50 lb 96.4; 100-1900 lb 94.4; 2000 lb and over 92.4.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

RENT OR BUY
HEAVY-DUTY FORK
LIFTRUK
on the
"DAY-BY-DAY EARN-ITS-WAY PLAN"

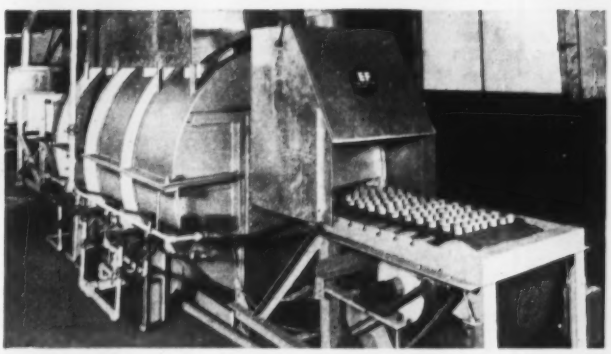
5-7½-10-15 ton CAPACITIES

If you can reasonably use a Heavy Duty LIFTRUK for at least two hours a day average, to improve the movement of goods in process or reduce materials handling operations, then you should be interested in this unusual "rent-or-pay-as-you-use" plan. Proper cost accounting methods often show that man-hours saved, storage space gained, or time in transit reduced, add up to a profit well above the payments required for LIFTRUK for purchase or rental charges.

Write for "Earn-Its-Way" Plan to

SILENT HOIST & CRANE CO.
Pioneers of Heavy Duty Materials Handling Equipment
849 63rd Street, Brooklyn 20, N. Y.

EF



An EF Gas Fired Cylindrical Muffle Continuous Furnace—one of numerous sizes and types we have built for sintering iron and non-ferrous powder products.

Check with
THE ELECTRIC FURNACE CO.
FOR FERROUS AND NON-FERROUS SINTERING FURNACES THAT PROVIDE FOR . . .

(a) maximum pounds of quality product per dollar of investment.
(b) lowest cost per pound for the sintering operation.
(c) maximum uniformity of size for sintered products.

● Extensive experience in all heat processing phases in connection with powder metallurgy has enabled EF engineers to develop equipment for producing some really outstanding results.

We would like to discuss some of our latest furnace developments with you, if interested.

Gas-Fired, Oil-Fired EF *and Electric Furnaces*
for any Process, Product or Production
THE ELECTRIC FURNACE CO.
WILSON ST. at PENNA. R. R. *Salem - Ohio*

Canadian Associates • CANEFCO LIMITED • Toronto 1, Canada

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 149. Key to footnotes, page 151.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ....$61.50

INGOTS, Alloy (NT)

Detroit R7 ....$65.00
Houston 85 ....73.00
Midland,Pa. C18 ....65.00
Munhall,Pa. U5 ....65.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 ....64.00
Buffalo R2 ....64.00
Clairton,Pa. U5 ....64.00
Ensley,Ala. T2 ....64.00
Fairfield,Ala. T2 ....64.00
Fontana,Calif. K1 ....72.00
Gary,Ind. U5 ....64.00
Johnstown,Pa. B2 ....64.00
Lackawanna,N.Y. B2 ....64.00
Munhall,Pa. U5 ....64.00
So.Chicago,Ill. R2,U5 ....64.00
So.Duquesne,Pa. U5 ....64.00
Youngstown R2 ....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 ....78.00
Buffalo R2 ....78.00
Canton,O. R2 ....80.00
Clairton,Pa. U5 ....78.00
Conshohocken,Pa. A3 ....83.00
Ensley,Ala. T2 ....78.00
Fairfield,Ala. T2 ....78.00
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 ....78.00
Geneva,Utah C11 ....78.00
Houston 85 ....85.00
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2 ....78.00
LosAngeles B3 ....87.50
Munhall,Pa. U5 ....78.00
Seattle B3 ....91.50
So.Chicago R2,U5,W14 ....78.00
So.Duquesne,Pa. U5 ....78.00
So.SanFrancisco B3 ....87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 ....86.00
Canton,O. R2, T7 ....86.00
Conshohocken,Pa. A3 ....93.00
Detroit R7 ....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 ....86.00
Houston 85 ....93.00
Ind.Harbor,Ind. Y1 ....86.00
Johnstown,Pa. B2 ....86.00
Lackawanna,N.Y. B2 ....86.00
LosAngeles B3 ....106.00
Massillon,O. R2 ....86.00
Midland,Pa. C18 ....86.00
Munhall,Pa. U5 ....86.00
So.Chicago, R2,U5,W14 ....86.00
So.Duquesne,Pa. U5 ....86.00
Struthers,O. Y1 ....86.00
Warren,O. C17 ....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ....$96.50
Canton,O. R2 ....96.50
Cleveland R2 ....96.50
Gary,Ind. U5 ....96.50
So.Chicago R2, W14 ....96.50
So.Duquesne,Pa. U5 ....96.50

SKELP

Aliquippa,Pa. J5 ....4.00
Fontana,Calif. K1 ....4.775
Munhall,Pa. U5 ....3.90
Warren,O. R2 ....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ....4.675
Aliquippa,Pa. J5 ....4.675
Alton,Ill. L1 ....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 ....4.675
Donora,Pa. A7 ....4.675
Fairfield,Ala. T2 ....4.675
Fontana,Calif. K1 ....5.475
Houston 85 ....5.075
IndianaHarbor,Ind. Y1 ....4.675
Johnstown,Pa. B2 ....4.675
Joliet,Ill. A7 ....4.675
KansasCity,Mo. S5 ....5.015
Kokomo,Ind. C16 ....4.775
LosAngeles B3 ....5.475
Minnequa,Colo. C10 ....4.925
Monessen,Pa. P7 ....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ....5.325
Portsmouth P12 ....4.675
Roebling,N.J. R5 ....4.775
So.Chicago,Ill. R2 ....4.675
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 ....4.775
Struthers,O. Y1 ....4.675
SparrowsPoint,Md. B2 ....4.775
Torrance,Calif. C11 ....5.475
Worcester,Mass. A7 ....4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 ....4.25
Aliquippa,Pa. J5 ....4.25
Bessemer,Ala. T2 ....4.25
Bethlehem,Pa. B2 ....4.30
Birmingham C15 ....4.25
Clairton,Pa. U5 ....4.25
Fairfield,Ala. T2 ....4.25
Fontana,Calif. K1 ....4.90
Gary,Ind. U5 ....4.25
Geneva,Utah C11 ....4.25
Houston 85 ....4.65
Ind.Harbor,Ind I-2 ....4.25
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ....4.30
LosAngeles B3 ....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 ....4.25
Niles,Calif. P1 ....4.80
Phoenixville,Pa. P4 ....3.95
Portland,Oreg. O4 ....5.00
Seattle B3 ....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 ....4.25

Wide Flange

Bethlehem,Pa. B2 ....4.30
Clairton,Pa. U5 ....4.25
Fontana,Calif. K1 ....5.25
Lackawanna,N.Y. B2 ....4.30
Munhall,Pa. U5 ....4.25
Phoenixville,Pa. P4 ....3.95
So.Chicago,Ill. U5 ....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 ....5.20
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 ....5.20
Houston 85 ....5.60
Munhall,Pa. U5 ....5.20
So.Chicago,Ill. U5 ....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 ....6.40
Bessemer,Ala. T2 ....6.40
Bethlehem,Pa. B2 ....6.45
Clairton,Pa. U5 ....6.40
Fairfield,Ala. T2 ....6.40
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 ....6.40
Geneva,Utah C11 ....6.40
Houston 85 ....6.80
Ind.Harbor,Ind. I-2, Y1 ....6.40
Johnstown,Pa. B2 ....6.45
KansasCity,Mo. S5 ....7.00
Lackawanna,N.Y. B2 ....6.45
LosAngeles B3 ....7.10
Munhall,Pa. U5 ....6.40
Seattle B3 ....7.15
So.Chicago,Ill. U5, W14 ....6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 ....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ....6.45
Munhall,Pa. U5 ....6.40
So.Chicago,Ill. U5 ....6.40

PILING

BEARING PILES

Munhall,Pa. U5 ....4.25
So.Chicago,Ill. U5 ....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ....5.075
Lackawanna,N.Y. B2 ....5.075
Munhall,Pa. U5 ....5.075
So.Chicago,Ill. U5 ....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ....4.225
Aliquippa,Pa. J5 ....4.225
Ashland,Ky.(15) A10 ....4.225
Bessemer,Ala. T2 ....4.225
Buffalo R2 ....4.225
Clairton,Pa. U5 ....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 ....4.225
Coatesville,Pa. L7 ....4.225
Conshohocken,Pa. A3 ....4.225
Ecorse,Mich G5 ....4.375
Fairfield,Ala. T2 ....4.225
Fontana,Calif.(30) K1 ....4.875
Gary,Ind. U5 ....4.225
Geneva,Utah C11 ....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....3.975
Houston 85 ....4.625
Ind.Harbor,Ind. I-2, Y1 ....4.225
Johnstown,Pa. B2 ....4.225
Lackawanna,N.Y. B2 ....4.225
LoneStar,Tex. L6 ....4.55
Mansfield,O. E6 ....4.225
Minnequa,Colo. C10 ....5.075
Munhall,Pa. U5 ....4.225
Newport,Ky. N9 ....4.225
Pittsburgh J5 ....4.225
Riverdale,Ill. A1 ....4.225
Seattle B3 ....5.125
Sharon,Pa. S3 ....4.225
So.Chicago,Ill. R2 ....4.225
So.Chicago,Ill. U5,W14 ....4.225
SparrowsPoint,Md. B2 ....4.225
Steubenville,O. W10 ....4.225
Warren,O. R2 ....4.225
Weirton,W.Va. W6 ....4.225
Youngstown R2,U5,Y1 ....4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ....6.025
Geneva,Utah C11 ....5.375

PLATES, Wrought Iron

Economy,Pa. B14 ....9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ....6.45
Bessemer,Ala. T2 ....6.45
Clairton,Pa. U5 ....6.45
Cleveland J5, R2 ....6.45
Conshohocken,Pa. A3 ....6.45
Ecorse,Mich. G5 ....6.60
Fairfield,Ala. T2 ....6.45
Fontana,Calif.(30) K1 ....7.15
Gary,Ind. U5 ....6.45
Geneva,Utah C11 ....6.45
Houston 85 ....6.85
Ind.Harbor,Ind. I-2, Y1 ....6.45
Johnstown,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ....6.45
LosAngeles B3 ....7.35
Munhall,Pa. U5 ....6.45
Pittsburgh J5 ....6.45
Seattle B3 ....7.35
Sharon,Pa. S3 ....6.45
So.Chicago,Ill. U5, W14 ....6.45
SparrowsPoint,Md. B2 ....6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy

Claymont,Del. C22 ....5.80
Coatesville,Pa. L7 ....5.80
Fontana,Calif.K1 ....6.45
Gary,Ind. U5 ....5.80
Houston 85 ....6.20
Johnstown,Pa. B2 ....5.80
Munhall,Pa. U5 ....5.80
Newport,Ky. N9 ....5.80
Seattle B3 ....6.70
Sharon,Pa. S3 ....5.80
So.Chicago,Ill. U5, W14 ....5.80
SparrowsPoint,Md. B2 ....5.80

FLOOR PLATES

Cleveland J5 ....5.275
Conshohocken,Pa. A3 ....5.275
Harrisburg,Pa. C5 ....5.15
Ind.Harbor,Ind. I-2 ....5.275
Munhall,Pa. U5 ....5.275
So.Chicago,Ill. U5 ....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10 ....4.475
Ashland l.c.l. (15) A10 ....4.975
Cleveland c.l. R2 ....4.825
Warren,O. c.l. R2 ....4.825

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2 ....4.30
Aliquippa,Pa. J5 ....4.30
Alton,Ill. L1 ....4.50
Atlanta,Ga. A11 ....4.50
Bessemer,Ala. T2 ....4.30
Birmingham C15 ....4.30
Buffalo R2 ....4.30
Canton,O. R2 ....4.40
Clairton,Pa. U5 ....4.30
Cleveland R2 ....4.30
Ecorse,Mich. G5 ....4.45
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 ....4.30
Fairless,Pa. U5 ....4.45
Fontana,Calif. K1 ....5.00
Gary,Ind. U5 ....4.30
Houston 85 ....4.70
Ind.Harbor,Ind. I-2, Y1 ....4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ....4.30
LosAngeles B3 ....5.00
Massillon,O. R2 ....4.40
Milton,Pa. M18 ....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 ....4.85
N.Tonawanda,N.Y. B11 ....4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 ....4.30
Portland,Oreg. O4 ....5.05
Seattle B3, N14, P23 ....5.05
So.Chicago, R2,U5,W14 ....4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ....5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 ....4.40
Struthers,O. Y1 ....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 ....4.30
Weirton,W.Va. W6 ....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ....5.075
Buffalo R2 ....5.075
Canton,O. R2, T7 ....5.075
Clairton,Pa. U5 ....5.075
Detroit R7 ....5.075
Ecorse,Mich. G5 ....5.225
Fontana,Calif. K1 ....6.125
Fairless,Pa. U5 ....5.225
Gary,Ind. U5 ....5.075
Houston 85 ....5.475
Ind.Harbor,Ind. I-2, Y1 ....5.075
Johnstown,Pa. B2 ....5.075
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ....5.075
LosAngeles B3 ....6.125
Massillon,O. R2 ....5.075
Midland,Pa. C18 ....5.075
So.Chicago R2, U5, W14 ....5.075
So.Duquesne,Pa. U5 ....5.075
Struthers,O. Y1 ....5.075
Warren,O. C17 ....5.075
Youngstown U5 ....5.075

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ....6.45
Bessemer,Ala. T2 ....6.45
Bethlehem,Pa. B2 ....6.45
Clairton,Pa. U5 ....6.45
Cleveland R2 ....6.45
Ecorse,Mich. G5 ....6.60
Fairfield,Ala. T2 ....6.45
Fontana,Calif. K1 ....7.70
Gary,Ind. U5 ....6.45
Houston 85 ....6.85
Ind.Harb.,Ind. I-2, Y1.. ....6.45
Johnstown,Pa. B2 ....6.45
KansasCity,Mo. S5 ....7.05
Lackawanna,N.Y. B2 ....6.45
LosAngeles B3 ....7.15
Pittsburgh J5 ....6.45
Seattle B3 ....7.20
So.Chicago W14 ....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 ....6.45
Warren,O. R2 ....6.45
Youngstown U5 ....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 ....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ....4.30
Atlanta A11 ....4.50
Fontana,Calif. K1 ....5.00
Niles,Calif. P1 ....4.85
Portland,Oreg. O4 ....5.05
SanFrancisco S7 ....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ....5.20
Gary,Ind. U5 ....5.20
Houston 85 ....5.60
KansasCity 85 ....5.80
Youngstown U5 ....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12,R2 5.40
Buffalo B5 ....5.45
Camden,N.J. P13 ....5.85
Carnegie,Pa. C12 ....5.40
Chicago W18 ....5.40
Cleveland A7, C20 ....5.40
Detroit R7 ....5.40
Detroit B5, P17 ....5.60
Donora,Pa. A7 ....5.40
Elyria,O. W8 ....5.40
FranklinPark,Ill. N5 ....5.40
Gary,Ind. R2 ....5.40
GreenBay,Wis. F7 ....5.40
Hammond,Ind. L2, M13 5.40
Hartford,Conn. R2 ....5.90
Harvey,Ill. B5 ....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Monaca,Pa. S17 ....5.40
Newark,N.J. W18 ....5.85
NewCastle,Pa.(17) B4 ....5.40
Pittsburgh J5 ....5.40
Plymouth,Mich. P5 ....5.65
Putnam,Conn. W18 ....5.95
Readville,Mass. C14 ....5.95
St.Louis,Mo. M5 ....5.70
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 ....5.85
Struthers,O. Y1 ....5.40
Waukegan,Ill. A7 ....5.40
Worcester,Mass. W19 ....5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19 4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 ....6.625
Buffalo B5 ....6.625
Camden,N.J. P13 ....6.80
Canton,O. T7 ....6.625
Carnegie,Pa. C12 ....6.625
Chicago W18 ....6.625
Cleveland A7, C20 ....6.625
Detroit R7 ....6.625
Detroit B5, P17 ....6.825
Donora,Pa. A7 ....6.625
Elyria,O. W8 ....6.625
Gary,Ind. R2 ....6.625
GreenBay,Wis. F7 ....6.625
Hammond,Ind. L2, M13 6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 ....6.625
Lackawanna,N.Y. B2 ....6.625
LosAngeles S30 ....8.30
Mansfield,Mass. B5 ....6.925
Massillon,O. R2, R8 ....6.625
Midland,Pa. C18 ....6.625
Monaca,Pa. S17 ....6.625
Newark,N.J. W18 ....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 ....6.625
SpringCity,Pa. K3 ....6.80
Struthers,O. Y1 ....6.625
Warren,O. C17 ....6.625
Waukegan,Ill. A7 ....6.625
Worcester,Mass. A7 ....6.625
Youngstown F3, Y1 ....6.625

BARS, Reinforcing (fabricators)

Ala.City,Ala. R2 ....4.30
Atlanta A11 ....4.50
Birmingham C15 ....4.30
Buffalo R2 ....4.30
Cleveland R2 ....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 ....4.30
Fairless,Pa. U5 ....4.45
Fontana,Calif. K1 ....5.00
Ft.Worth,Tex.(42) T4 ....4.90
Gary,Ind. U5 ....4.30
Houston 85 ....4.70

Ind.Harbor, Ind. I-2, Y1 4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ..5.15
Seattle B3, N14, P23..5.05
So.Chicago R2 .....4.30
So.Duquesne,Pa. U5 ...4.30
So.SanFrancisco B3 ...5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing
(Fabricated; to consumers)

Johnstown,Pa., ¼-1" P2.5.70
KansasCity S5 .....6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Seattle B3, N14, P23 ..6.15
So.SanFrancisco B3 ...6.00
SparrowsPt. ½-1" B2...5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa. (3) F5 ..4.20
Franklin,Pa. (4) F5 ..4.30
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 .....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 ....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks.(S.R.) L5 ..10.85
McK.Rks.(D.R.) L5 ..14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 gage and heavier)

Ala.City,Ala. R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ...4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ..4.10
Detroit(8) M1 .....4.20
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.05
Fairless,Pa. U5 .....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 ....4.25
Houston S5 .....4.45
Ind.Harbor,Ind. I-2, Y1.4.05
Irvin,Pa. U5 .....4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ..4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6 (38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 ga. lighter)

Ala.City,Ala. R2 .....5.35
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.10
Fairless,Pa. U5 .....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Irvin,Pa. U5 .....6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3 ....5.00
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....4.95
Fairless,Pa. U5 .....5.00
Follansbee,W.Va. F4 ..4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 ....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Irvin,Pa. U5 .....4.95
Lackawanna,N.Y. B2 ..4.95
Middletown,O. A10 ....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 .....4.95
SparrowsPoint,Md. B2 ..4.95
Steubenville,O. W10 ....4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Ecorse,Mich. G5 .....7.65
Fairless,Pa. U5 .....7.55
Fontana,Calif. K1 ....8.55
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1..7.50
Irvin,Pa. U5 .....7.50
Lackawanna(37) B2 ...7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Clevelaid R2 .....5.55
Middletown,O. A10 .....5.45
Warren,O. R2 .....5.55

SHEETS, Culvert (16 Ga.)	Cu Alloy	Cu Fe
Ashland,Ky.	A10 6.50	....
Canton,O.	R2 ..6.50	7.10
Fairfield	T2 ....5.70	....
Gary,Ind.	U5 ...5.70	5.95
Ind.Harbor	I-2 ..6.25	6.50
Irvin,Pa.	U5 ...5.70	....
Kokomo,Ind.	C16 6.35	....
MartinsFry.,O.	W10 6.25	....
Newport,Ky.	N9..6.25	6.50
Pitts.,Calif.	C11..6.45	....
SparrowsPt.	B2..5.70	....

SHEETS, Culvert Pure Iron

Ashland,Ky. A10 .....6.75
MartinsFerry,O. W10 ..6.50
Gary,Ind. U5 .....5.95

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Dover,O. R1 .....5.45‡
Fairfield,Ala. T2 .....5.45*
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ...5.45†
Irvin,Pa. U5 .....5.45†
Kokomo,Ind. C16 ....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45†
Newport,Ky. N9 .....5.45†
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ..6.20‡
SparrowsPt.,Md. B2 ..5.45‡
Steubenville,O. W10 ..5.45‡
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Galvanized
High-Strength Low-Alloy

Irvin,Pa. U5 .....8.20
SparrowsPoint(39) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Irvin,Pa. U5 .....5.85
Kokomo,Ind. C16 ....5.95†
Newport,Ky. N9 .....6.00
Niles,O. N12 .....6.00

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70
Canton,O. R2 .....6.20

SHEETS, Galvanized
Ingot Iron
(Hot-dipped continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 ....6.175

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.375
Cleveland R2 .....5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ..5.375
Irvin,Pa. U5 .....5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.25

SHEETS, Wall Casing

Fontana,Calif. K1 ....6.325

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wick-Wire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless WeldedProducts
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn.Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan.San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2....4.05
Allenport,Pa. P7 .....4.05
Alton,Ill. L1 .....4.225
Ashland,Ky.(8) A10 ....4.05
Atlanta A11 .....4.25
Bessemer,Ala. T2 .....4.05
Birmingham C15 .....4.05
Bridgeport,Conn.(10)S15 4.05
Buffalo(27) R2 .....4.05
Conshohocken,Pa. A3....4.10
Detroit M1 .....4.20
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.05
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Houston,Tex. S5 .....4.45
Ind.Harbor,Ind. I-2, Y1.4.05
Johnstown,Pa.(25) B2 ..4.05
KansasCity,Mo.(9) S5 ..4.65
Lackaw'na,N.Y.(25) B2.4.05
LosAngeles(25) B3 .....4.80
Milton,Pa. M18 .....4.06
Minnequa,Colo. C10 ....5.15
NewBritain(10) S15 .....4.05
N.Tonawanda,N.Y. B11.4.05
Pittsburg,Calif. C11 ....4.80
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
SanFrancisco S7 .....5.00
Seattle(25) B3, P23 ....5.05
Seattle N14 .....5.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
So.SanFrancisco(25) B3.4.80
SparrowsPoint,Md. B2 ..4.05
Sterling(1) N15 .....4.05
Sterling,Ill. N15 .....4.15
Torrance,Calif. C11 ....4.80
Warren,O. R2 .....4.05
Weirton,W.Va. W6 .....4.05
Youngstown U5 .....4.06

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.70
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....6.70
Houston,Tex. S5 .....7.10
KansasCity,Mo. S5 .....7.30
LosAngeles B3 .....7.90
NewBritn.,Conn.(10)S15 6.45
Newport,Ky. N9 .....6.70
Seattle P23 .....7.80
Sharon,Pa. S3 .....6.70
So.Chicago W14 .....6.70
Youngstown U5 .....6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.15
Conshohocken,Pa. A3 ...6.15
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....6.15
Fontana,Calif. K1 .....7.25
Gary,Ind. U5 .....6.15
Houston S5 .....6.55
Ind.Harbor,Ind. I-2, Y1.6.15
KansasCity,Mo. S5 ....6.75
Lackawanna,N.Y. B2 ..6.15
LosAngeles(25) B3 .....6.90
Seattle(25) B3, P23.....7.15
Sharon,Pa. S3 .....6.15
So.SanFrancisco(25) B3.6.90
SparrowsPoint,Md. B2 ..6.15
Warren,O. R2 .....6.15
Weirton,W.Va. W6 .....6.15
Youngstown U5, Y1 ....6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....4.30
Warren,O. R2 .....4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.75
Baltimore T6 .....5.75
Bridgeport,Conn.(10)S15 5.75
Cleveland A7, J5 .....5.75
Conshohocken,Pa. A3 ....5.80
Dearborn,Mich. D3 .....5.90
Detroit D2, M1 .....5.90
Detroit P20 .....5.95
Dover,O. G6 .....5.75
Ecorse,Mich. G5 .....5.90
Follansbee,W.Va. F4 ...6.75
Fontana,Calif. K1 .....7.65
FranklinPark,Ill. T6 ....5.85
Ind.Harbor,Ind. I-2 ....6.00
Indianapolis C8 .....5.90
Lackawanna,N.Y. B2 ...5.75
LosAngeles C1 .....7.80
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.75
NewBedford,Mass. R10..6.20
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5 ..5.75
NewHaven,Conn. A7 ....6.50
NewHaven,Conn. D2 ....6.20
Pawtucket,R.I. R3 ....6.40
Pawtucket,R.I. N8 ....6.30
Pittsburgh J5 .....5.75
Portsmouth,O. P12 ....5.75
Riverdale,Ill. A1 .....5.85
Rome,N.Y.(32) R6 ....5.75
Sharon,Pa. S3 .....5.75
SparrowsPt.,Md. B2 ....5.75
Trenton,N.J.(31) R5 ...7.30
Wallingford,Conn. W2...6.20
Warren,O. B9, R2, T5..5.75
Weirton,W.Va. W6 .....5.75
Worcester,Mass. A7 ....6.60
Youngstown C8, Y1 ....5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18 .....12.45
Cleveland A7 .....12.45
Dover,O. G6 .....12.45
Fontana,Calif. K1 ....14.55
FranklinPark,Ill. T6 ..12.45
Harrison,N.J. C18 ....12.45
Mattapan,Mass. T6 ....12.80
Pawtucket,R.I. N8 ....12.80
Sharon,Pa. S3 .....12.45
Worcester,Mass. A7 ...12.75
Youngstown C8.....12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5 .....8.60
Dearborn,Mich. D3 ....8.75

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15	5.75	8.05	9.30	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.90	8.25	9.20	....	....
Detroit D2	5.90	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
Mattapan,Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15.	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill.(1) A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6..	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.86	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Arma-ture	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
IndianaHarbor,Ind. I-2	8.025	8.50	9.10	10.10	....
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Arma-ture	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.26	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. ‡ Coils. ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.60	7.85	8.25
Fairless,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1..	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.,Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.60
Fairfield,Ala. T2	6.70
Fairless,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1.	6.60
Irvin,Pa. U5	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Irvin,Pa. U5	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5	$7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..5.75
Aliquippa,Pa. J5 .....5.75
Alton,Ill. L1 .....5.925
Atlanta A11 .....5.95
Bartonville,Ill. K4 .....5.85
Buffalo W12 .....5.75
Chicago W13 .....5.75
Cleveland A7, C20 .....5.75
Crawfordsville,Ind. M8..5.85
Donora,Pa. A7 .....5.75
Duluth,Minn. A7 .....5.75
Fairfield,Ala. T2 .....5.75
Fostoria,O.(24) S1 .....5.95
Houston S5 .....6.15
Jacksonville,Fla. M8 ...6.27
Johnstown,Pa. B2 .....5.75
Joliet,Ill. A7 .....5.75
KansasCity,Mo. S5 .....6.35
Kokomo,Ind. C16 .....5.85
LosAngeles B3 .....6.70
Minnequa,Colo. C10 ....6.00
Monessen,Pa. P7 .....5.75
Newark 6-8 ga. I-1 ....6.40
No.Tonawanda B11 .....5.75
Palmer,Mass. W12 .....6.05
Pittsburg,Calif. C11 ....6.70
Portsmouth,O. P12 .....5.75
Rankin, Pa. A7 .....5.75
So.Chicago,Ill. R2 .....5.75
So.SanFrancisco C10 ...6.70
SparrowsPoint,Md. B2 ..5.85
Sterling,Ill.(1) N15 .....5.75
Sterling,Ill. N15 .....5.85
Struthers,O. Y1 .....5.75
Waukegan,Ill. A7 .....5.75
Worcester,Mass. A7 ....6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....7.20
Alton,Ill. L1 .....7.375
Bartonville,Ill. K4 .....7.30
Buffalo W12 .....7.20
Cleveland A7 .....7.20
Donora,Pa. A7 .....7.20
Duluth,Minn. A7 .....7.20
Fostoria,O. S1 .....7.20
Johnstown,Pa. B2 .....7.20
LosAngeles B3 .....8.15
Millbury,Mass.(12) N6 ..7.50
Minnequa,Colo. C10 ....7.45
Monessen,Pa. P7, P16...7.20
Muncie,Ind. I-7 .....7.40
Palmer,Mass. W12 .....7.50
Pittsburg,Calif. C11 ....8.15
Portsmouth,O. P12 .....7.20
Roebling,N.J. R5 .....7.50
So.Chicago,Ill. R2 .....7.20
So.SanFrancisco C10 ...8.15
SparrowsPt.,Md. B2 ....7.30
Struthers,O. Y1 .....7.20
Trenton,N.J. A7 .....7.50
Waukegan,Ill. A7 .....7.20
Worcester A7,J4,T6,W12 7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....6.90
Alton,Ill. L1 .....7.075
Buffalo W12 .....6.90
Cleveland A7 .....6.90
Donora,Pa. A7 .....6.90
Duluth,Minn. A7 .....6.90
Johnstown,Pa. B2 .....6.90
KansasCity,Mo. S5 ....7.50
LosAngeles B3 .....7.85
Minnequa,Colo. C10 ...7.075
Monessen,Pa. P7, P16 ..6.90
NewHaven,Conn. A7 ....7.20
Palmer,Mass. W12 .....7.20
Pittsburg,Calif. C11 ....7.85
Portsmouth,O. P12 .....6.90
Roebling,N.J. R5 .....7.20
So.Chicago,Ill. R2 .....6.90
So.SanFrancisco C10 ...7.85
SparrowsPoint,Md. B2 ..7.00
Trenton,N.J. A7 .....7.20
Waukegan,Ill. A7 .....6.90
Worcester,Mass. A7 ....7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1 .....11.375
Bartonville,Ill. K4 ....11.30
Buffalo W12 .....11.20
Chicago W13 .....11 20
Cleveland A7 .....11.20
Crawfordsville,Ind. M8.11.30
Fostoria,O. S1 .....11.20
Jacksonville,Fla. M8 ..11.73
Johnstown,Pa. B2 .....11.20
Kokomo,Ind. C16 .....11.20
Minnequa,Colo. C10 ...10.95
Monessen,Pa. P16 .....11.20
Muncie,Ind. I-7 .....11.40
Palmer,Mass. W12 ....11.50
Roebling,N.J. R5 .....11.50
So.SanFrancisco C10 ...11.55
Waukegan,Ill. A7 .....11.20
Worcester,Mass. A7,T6.11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....9.90
Buffalo W12 .....9.90
Johnstown,Pa. B2 .....9.90
Minnequa,Colo. C10 ...10.025
Monessen,Pa. P16 .....9.90
Muncie,Ind. I-7 .....10.10
Portsmouth,O. D2 .....9.90
Roebling,N.J. R5 .....10.20
SparrowsPt.,Md. B2 ...10.00

ROPE WIRE (A)

Alton,Ill. L1 .....9.45
Bartonville,Ill. K4 .....9.35
Buffalo W12 .....9.75
Fostoria,O. S1 .....9.75
Johnstown,Pa. B2 .....9.75
Monessen,Pa. P7 .....9.35
Monessen,Pa. P16 .....9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....10.05
Portsmouth,O. P12 ....9.35
Roebling,N.J. R5 .....10.05
SparrowsPt. B2 .....9.85
Struthers,O. Y1 .....9.75
Worcester J4, T6 .....6.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton, Ill. L1	12.75
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
Kokomo,Ind. C16	8.05
FranklinPark,Ill. T6	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425‡
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ....
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.30 7.70†
Jacks'ville,Fla. M8	7.425 7.95
JohnstownB2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.50 7.90†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ....
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
S.S.Fran. C10	7.85 8.25**
SparrowsPt.B2(48)	7.00 7.55*
Sterling(1)(48)N15	6.90 7.45
Struthers,O.(48)Y1	6.90 7.40‡
Worcester A7	7.20 ....

* Based on 11c zinc; † 5c zinc; ‡ Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga. Col.

Ala.City,Ala R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149§
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	154†
Johnstown,Pa. (43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	158†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	154**
Monessen,Pa. 9 ga. P17	151
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

† Based on 5c zinc; * 11c zinc; § 10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single loop Col.

AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville, Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston 85	163
KansasCity,Mo. S5	167
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed Col.

Alabama,City,Ala. R2	159**
Aliquippa J5	156§
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	167†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	171†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	165**
Monessen,Pa. P7	163
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S. SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	162

† Based on 5c zinc; * 11c zinc; § 10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)	An'd Galv.	Stone	Stone
Ala.City R2	13.15	14.70**	
Bartonville K4	13.25	15.10	
Buffalo W12	13.15	....	
Cleveland A7	13.15	....	
CrawfrdsvilleM8	13.25	15.10	
Fostoria,O. S1	13.25	14.80†	
Johnstown B2	13.15	15.00*	
Kokomo C16	13.25	15.10*	
Minnequa C10	13.40	15.10**	
Palmer,Mas.W12	13.15	14.70*	
Pitts.,Calif. C11	13.50	15.05†	
So.Chicago R2	13.15	14.70	
SparrowsPt. B2	13.25	15.10*	
Sterling(1) N15	13.15	15.00	
Waukegan A7	13.15	14.70†	
Worcester A7	13.45	....	

* Based on 11c zinc; † 5c zinc; § 10c zinc; ** Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	145
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	149
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	140
Crawfordsville,Ind. M8	140
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	140
Minnequa,Colo. C10	143
Monessen,Pa. P7	138
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill.(1) N15	143
Worcester,Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	150
Duluth,Minn. A7	150
Franklin,Pa. F5	150
Johnstown,Pa. B2	150
Marion,O. P11	150
Minnequa,Colo. C10	155
Moline,Ill. R2	155
So.Chicago,Ill. R2	150
Tonawanda,N.Y. B12	150
Williamsport,Pa. S19	150

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants).

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾ in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoes	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
¾" and smaller	55
⅞" to 1⅛", inclusive	58
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5—10
Plated finishes	30—10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1⅝	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	All No. 2	Std. Toe Rails 60 lb Under
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
Huntington,W.Va. W7	...	...	...	5.35
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williampsort,Pa. S19	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle,Wash. B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2 Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns—$3.00-148.00	
Aluminum:	
Atomized, 500 lb drums, frgt, allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	32.00*
Brass, ¼-ton lots	29.75-37.75†
Bronze, ¼-ton lots	31.00-39.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	44.25‡
Nickel-Silver, ¼-ton lots	47.00**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, ¼-ton lots, 17.25-31.00‡	
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.35c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6-7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1⅛		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	....	....	....
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	41.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.80	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	36.00	41.00	39.25	42.25	44.75	48.75	48.75
306	19.50	26.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	36.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	42.75	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	46.75	54.50	54.00	55.50	59.00	68.50	68.50
310	32.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.50	54.50	53.25	55.50	58.75	62.75	62.75
316L	....	....	51.50	59.50	58.25	60.50	63.75	67.75	67.75
317	33.00	43.50	57.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	45.75	50.50	50.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	31.00	41.00	48.25	56.00	56.50	57.50	62.25	70.50	70.50
348	....	....	48.25	....	....	57.50	62.25	70.50	70.50
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	18.75	24.50	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75
501	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless:	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets Carbon Base 20%
302	....	31.00	31.00
304	27.60–28.10	32.50–33.20	32.50
310	36.50	41.00	....
316	32.60–33.10	37.70–42.75	42.75
318	37.00–37.50	42.20–42.70	....
321	29.36–29.80	34.40–37.00	37.00
347	30.40–30.90	35.50–40.50	40.50
405	23.40–23.90	30.60–31.10	....
410	22.00–23.40	30.10–30.60	....
430	23.40	30.60	....
Inconel	46.90	61.90	....
Nickel	38.30	51.70	....
Monel	39.70	52.66	....
Copper*	....	....	46.00

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	28.85	35.85	25.00	32.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	52.38	52.88	....	....
Birmingham U5	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo R2	56.00	56.50	57.00	57.50
Buffalo H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	....	....	....
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
Neville Island,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona, Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	85.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	85.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York and Boston, 10 cents; Buffalo, 25 cents on C.R. sheets, galv. sheets, C.F. and alloy bars and 20 cents on other commodities; Seattle, Spokane, Wash., no charge.

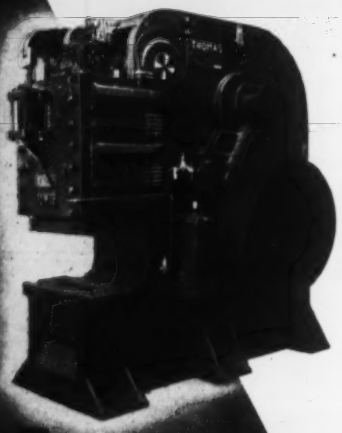
	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††*		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.52[6]	12.04	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[2]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	44.78[9]	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.72	6.65	7.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	45.55	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.25	7.70	9.83	....	7.60	9.30	7.60	9.40	....	7.50	7.25	8.65
Los Angeles	7.40	9.25	9.85	50.15	7.75	11.75	7.35	10.05	13.20	7.55	7.35	9.45
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.45	7.56	...	7.37	8.73[6]	12.28	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[9]	6.96	8.80	6.74	8.36[6]	12.10	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	45.50	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64
Portland, Oreg.	7.60	8.75	9.70	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.26	....	7.35	7.18	8.30
San Francisco	7.55	9.85	9.40	51.65	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.05	....	7.80	...	7.80	10.85‡‡	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati (11.50-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999; [2]—500 to 9999 lb; [4]—4000 lb and over; [6]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

for top-production steel fabricating

1



2

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(1) Beam Punch and Motorized Indicator Spacing Table for beam, angle, channel and cover plate punching without layout

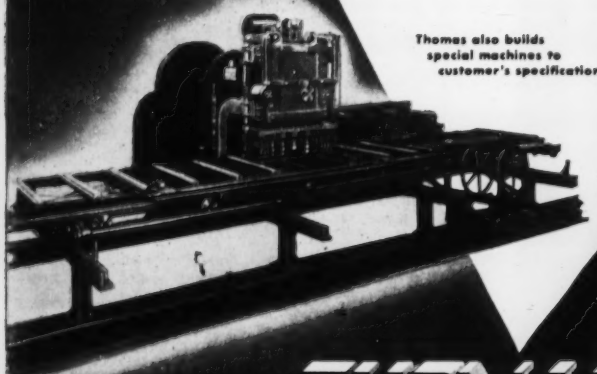
(2) All-Steel Vertical Punch or Shear for heavy-duty work

(3) Plate Duplicator for rapid, economical plate punching

(4) Heavy-Duty Mill Type Plate Shear, capacity 1¼" by 6' stainless 120,000 psi

THE TREND IS TO THOMAS

Thomas also builds special machines to customer's specifications



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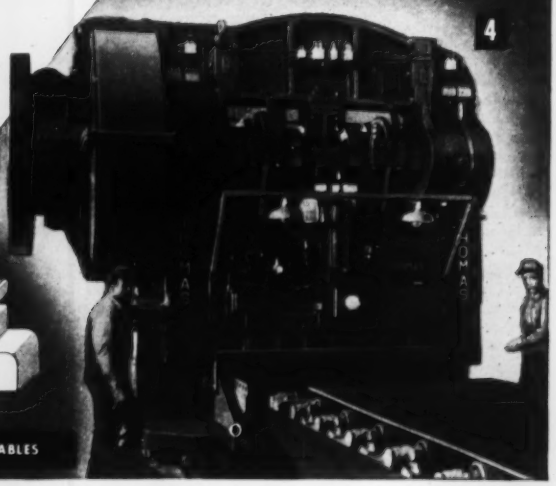


4

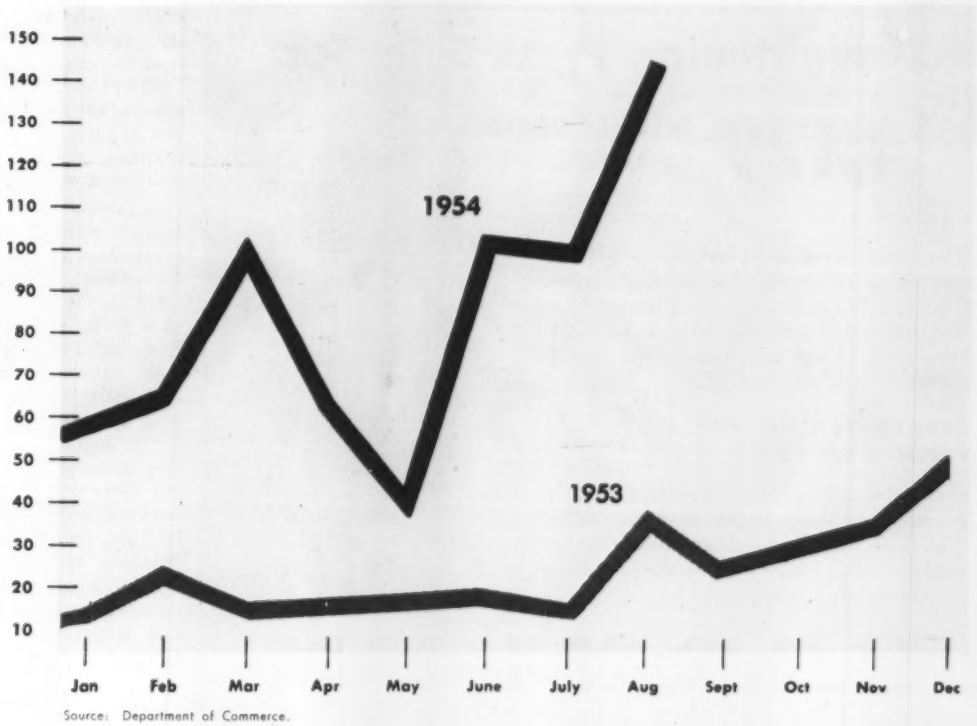
THOMAS

MACHINE MANUFACTURING CO.

PUNCHES · SHEARS · PRESSES · BENDERS · SPACING TABLES

U.S. Exports of Ferrous Scrap

(thousands of net tons)



Source: Department of Commerce.

Why There's a Scrap Over Scrap

A GOOD SCRAP'S going on over scrap.

Sellers want to export it. Consumers want to keep it here.

Caught in Middle—Both sides look to the federal government as the arbiter. Each side wants the matter settled in its favor. Both have been presenting their cases to the Business & Defense Services Administration through a BDSA task force.

The argument started when iron and steel scrap exports this year soared far above those of last year (see the chart above). Reason for this big jump is simple: Government controls on the export of iron and steel scrap were relaxed by the Commerce department on April 1 of this year. Steel production in the U. S. was declining, so there was a reduced need for scrap. In foreign countries, steel production was rising, and so was the need for scrap.

Coastal Activity — Consequently, scrap sellers, mainly along the coasts of this country, became increasingly active in exporting. In the first eight months of this year, exports of iron and steel scrap totaled 684,861 net tons, compared to only 303,723 net tons in all of 1953.

Opponents of exports are largely the steel producers and foundries. They feel that foreign competition for U. S. scrap raises scrap prices and that this country is lowering its supply of metallics. Even patriotism is used as an argument against exports: Many people remember how scrap shipped to Japan came back at us as bullets in World War II. Let's not have a repetition of that, they urge. Some opponents believe that at least the best grades of scrap should not be exported.

Guesstimations — The Commerce department estimates that scrap exports this year will total around 1.2 million net tons, but some people think that the freedom with which export licenses are being granted will make the total much more than that. It's reported that licenses issued so far this year call for export of 1,675,000 net tons of iron and steel scrap.

Those in favor of exports say the loss of metallics from this country is not really as great as the export figures would suggest. They point out that scrap is constantly being imported into the U. S. Imports in the first eight months of this year totaled 85,021 net tons—a monthly average of 10,628 tons. Monthly average for all of last year was 10,964.

Quite a Cushion—Proponents also think there's enough scrap that exports can be made without any great pinch on supplies for domestic use. Last year domestic usage of purchased scrap totaled 31.6 million gross tons. This year it'll be about 25 million gross tons—6.6 million tons less than last year. That should allow exports of 1.2 million tons to

Chief Importers of U. S. Scrap First 8 Months, 1954 (net tons)

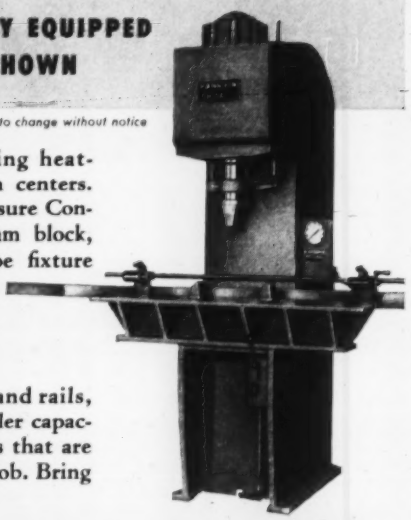
Japan	274,918
Mexico	159,851
Yugoslavia	42,543
United Kingdom	39,740
Spain	30,686
Canada	29,782
Austria	22,012
Argentina	21,428
West Germany	19,993
Belgium	13,232
Italy	10,516

Source: Department of Commerce.

This 25-TON Hannifin Straightening Press Sells For

$4,179 FULLY EQUIPPED AS SHOWN

Price F.O.B. our press plant at St. Marys, Ohio, subject to change without notice



The ideal press for straightening heat-treated parts up to 60" between centers. Exclusive Hannifin Sensitive Pressure Control for speed and accuracy. Ram block, two table blocks and center-type fixture complete with rails included.

STRAIGHTENING PRESSES FROM 5 TO 150 TONS

Hannifin offers longer tables and rails, roller-type fixtures, larger or smaller capacities (5 to 150 tons)—all at prices that are easily justified by savings on the job. Bring us your straightening problems.

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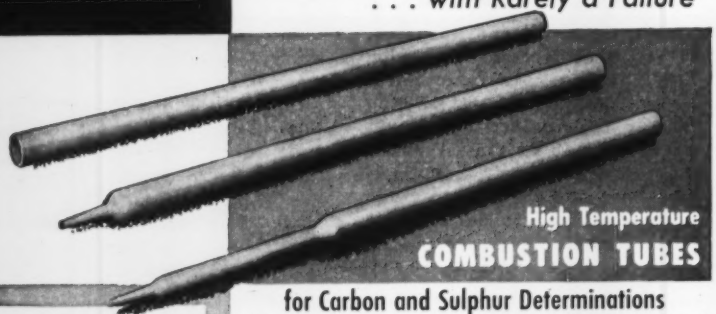
HANNIFIN CORPORATION, 523 S. WOLF ROAD, DES PLAINES, ILLINOIS

MORE Determinations per Tube

. . . with Rarely a Failure



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Immediately available are standard porcelain specialties such as retorts, flasks, crucibles, etc. Taking a little longer—but not much—are McDanel Porcelain parts especially developed and designed to meet your specific needs.

for Carbon and Sulphur Determinations

McDanel High Temperature Porcelain Combustion Tubes and Zirco Tubes keep laboratory control costs at rock bottom. They are non-spalling, non-blistering and gas-tight. McDanel Tubes are precision made in every detail and their specially-developed refractory body gives them top resistance to thermal shock. Always specify McDanel Tubes from your supplier or Dealer.

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McDANEL REFRACTORY PORCELAIN CO.
BEAVER FALLS, PENNA.

be made without pain, say the proponents.

They go even further, contending that scrap represents only a fraction of metal exports from this country. U. S. mill shipments of finished steel for export, for example, totaled 1,691,678 net tons in the first eight months of 1954. In addition, there are exports of iron ore, pig iron, castings, forgings, machinery and equipment made of iron and steel.

Arguments—One of the supporters of exports is the Institute of Scrap Iron & Steel Inc., Washington. It maintains that scrap iron and steel should be "licensed for export on a parity with other commodities." Some of the institute's arguments are: "There is no present shortage of scrap; there is no apprehension of a shortage even if the steel mill operating rate should register a further substantial increase; the potential reservoir of scrap has been expanding due to lack of demand in the last year; exports have been a lifesaver to dealers, especially in coastal areas, and are helping to maintain the machinery of collection and preparing scrap; if exports of scrap jeopardize the metallic position of the nation then equal treatment should be accorded to pig iron, iron ore and finished steel; exports of scrap are going entirely to friendly countries under supervision of the government."

Sheets, Strip . . .

Sheet & Strip Prices, Pages 149 & 150

Demand for the light, flat-rolled products is encouraging. Mills are steadily lengthening deliveries; cold-rolled and galvanized sheets are especially strong.

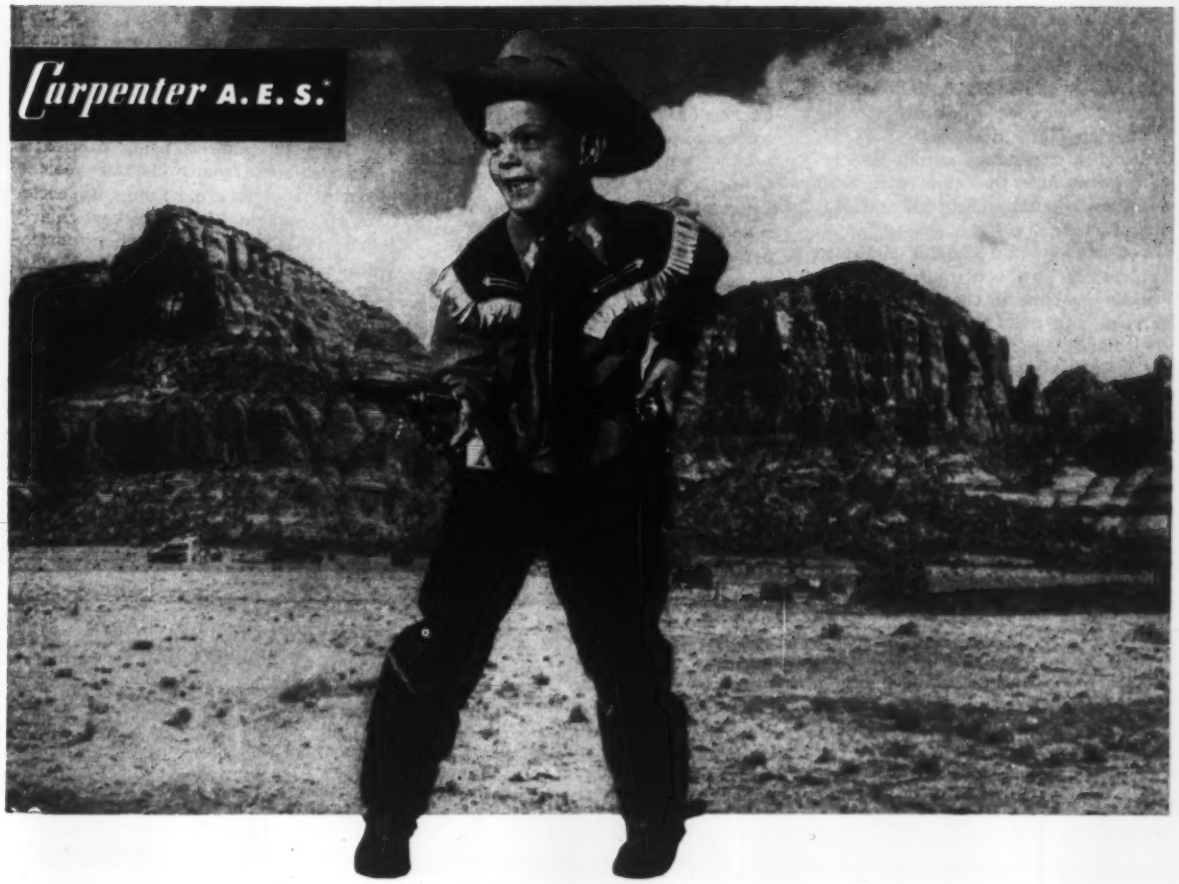
Some buyers are finding they waited too long to place orders and are being forced to go beyond regular suppliers to fill needs.

One Ohio mill currently is quoting 11 weeks delivery on cold-rolled sheets. Only a week or so ago, it could promise shipment in 7 weeks; a month ago it was 4 weeks. Generally, cold-rolled deliveries extend into January.

At the same time, shipment promises on continuous hot-dipped galvanized sheets extend as much as 18 weeks, on noncontinuous grades, up to 15 weeks, but shipments of the latter can still be had in 5 to 6 weeks by shopping around.

Indicative of the tight supply situation developing, a Chicago district producer is close to being sold out for first quarter on both cold-rolled and galvanized sheets.

Hot-rolled sheet shipments extend



Small Fry... Big Business

Another example of how Carpenter ***Application Engineering Service** *is helping industry cut costs, build sales.*

Mention cowboys and Indians to kids from 3 to 13 and their eyes light up, cap pistols start barking, and the fun is on. The game hasn't changed much or lost its excitement since we were small fry . . . but today it spells big business.

And making novelties like this decorative piece for belts and holsters in multi-million quantities, calls for a fine sense of production know-how and cost control. In this case, the Company wanted to hold down costs by cold forming the impressions in the dies, rather than machining them. This called for a special kind of die steel . . . one that would "take" the master form or hob but would still stand up in the presses under long, punishing runs.

Again, Carpenter was called in, and **A**pplication **E**ngineering **S**ervice went to work. Super Samson, a new steel developed in Carpenter laboratories for just such jobs, was recommended and used. Now the Company reports that Super Samson has saved considerable money in the *making* of the dies . . . and the Super Samson dies are turning out the novelties in big, profitable quantities.

Time and again, industry is finding new ways to save money and improve product sales with the help of Carpenter **A**pplication **E**ngineering **S**ervice . . . a service backed by almost 70 years of leadership in specialty steel development . . . a service that uses imagination to help your shopmen apply steels for best results. **A. E. S.** is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

Carpenter STEEL

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

into December as a general rule, though in the Chicago area both hot-rolled sheets and hot-rolled strip still are available in 2 to 3 weeks. Stainless strip schedules are into December in more instances.

Steadily expanding automotive requirements are the chief stimulant in the more active sheet market. But manufacturers of household appliances, cabinets and shelving and farm implements are contributing an increasing volume in the over-all sheet demand. In fact, the pickup in several miscellaneous lines along with the growing needs of the auto industry have awakened an interest among buyers of sheets not experienced in considerable time. Current buying not only is for immediate manufacturing requirements; in some cases it is for inventory, too.

Steel Bars . . .

Bar Prices, Page 148

Modest gain in the movement of commercial steel bars is accompanying expanding activity in the automotive industry and a quickening in a diversity of other manufacturing lines, including business machines, farm equipment and industrial fasteners.

Demand for hot-rolled carbon bars is definitely better in the East, with bolt and nut makers specifying more freely. Here, also, cold drawn bar makers are sharing in the improved demand from manufacturers of auto parts. But alloy bars, hot-rolled and cold-drawn, are not showing the same improvement.

At the same time, Pittsburgh sellers report demand increasingly more diversified with a greater number of consumers boosting requirements.

Despite the noticeable improvement in buying, deliveries on bars are not extended materially. In hot-rolled carbon, for instance, first rollings are still the rule. In New England deliveries on some sizes of cold-finished carbon bars have lengthened to seven weeks, but, generally, material is available from stock.

Revised quantity extras on hot-rolled alloy bars and spring sizes per 100 lb, effective Nov. 1, as announced by Republic Steel Corp.:

	All bars except odd size flats	Odd size flats
40,000 lb and over	none	none
Under 40,000 to 20,000 lb	$.05	$.10
Under 20,000 to 10,000 lb	.10	.40
Under 10,000 to 6,000 lb	.25	1.00
Under 6000 to 4000 lb	45% of net	45% of net
Under 4000 to 2000 lb	50% of net	50% of net
Under 2000 lb	55% of net	55% of net

Quantity extras shall be determined by the total weight of the size ordered (each width and thickness is a separate size) of one analysis or condition, released for shipment at one time to one destination. Extras on odd size flats apply on other than ¼-in. increments in width and ⅛-in. increments in thickness or any flats deviating from standard over and under tolerances for width and/or thickness. Extras are to be rounded to the nearest $.05 per 100 lb on lots of 6000 lb and under.

Tubular Goods . . .

Tubular Goods Prices, Page 152

Something of a mixed situation prevails in the market for tubular goods.

Seamless and welded pipe sales are sharing in the general improvement in demand for steel products this quarter, with buttweld sales, in particular, providing an encouraging note. At the same time, seamless pipe for oil country use is less active, confirming expectations of a late fourth quarter letdown.

Standard pipe for plumbing and heating requirements has passed the fall peak, and there is some leveling off in needs of public utilities.

The steel pipe mill at Houston, Tex., operated by A. O. Smith Corp. of Texas has been closed down for about two weeks because of a lack of orders. About 200 are affected.

Tin Plate . . .

Tin Plate Prices, Page 150

More tin plate is being fabricated than shipped from mills this quarter, but shipments are holding up better than anticipated. This is particularly true of shipments to smaller fabricators who do not have as much plate on hand as larger consumers. Demand for seconds, much of which is for shipment abroad, far exceeds supply.

Semifinished Steel . . .

Semifinished Prices, Page 148

Republic Steel Corp. has issued a revised schedule of quantity extras (per 100 lbs) on hot-rolled alloy and special steels, blooms, billets and slabs effective on shipments Nov. 1. The new schedule on blooms, billets and slabs is:

20 net tons and over	none
Under 20 to 10 tons inclusive	$1.00
Under 10 to 5 tons inclusive	2.00
Under 5 to 3 tons inclusive	5.00
Under 3 to 2 tons inclusive	45% of net
Under 2 to 1 ton inclusive	50% of net
Under 1 ton	55% of net

The extra shall be determined by the total weight ordered of one size of one analysis, or condition, released for shipment to one destination at one time. The extra should be rounded to the nearest $1 per net ton on lots 3 tons and under.

Wire . . .

Wire Prices, Pages 150 & 151

With the harvest completed, farmers are buying more wire for farm repairs. This is resulting in a modest increase in merchant sales. Manufacturers wire salesmen say automakers' orders reached a crest within the last two weeks and are leveling off.

November sales are expected to be at or above October levels, but the increase will probably be gradual.

Structural Shapes . . .

Structural Shape Prices, Page 148

Structural steel bookings totaled 206,606 tons in September, reports the American Institute of Steel Construction. This was an increase over the revised figure of 193,081 tons for August but off from the July total of 262,782 tons.

Cumulative bookings for the first nine months of the year were 1,904,003 tons. In the like period of 1953 the total was 2,238,194 tons.

September shipments at 265,388 tons were down from the August total of 272,479, but were slightly above the 265,181 tons shipped in July. Total shipments for the first nine months were reported at 2,424,841 tons, comparing with 2,297,482 in the corresponding period of last year.

Tonnage backlog as of Sept. 30

Steel Import Prices

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$5.05	$5.05	$4.95	$5.33
Bar Size Angles	4.60	4.60	4.60	4.98
Structural Angles	4.55	4.55	4.55	4.98
I-Beams	4.50	4.50	4.50	4.83
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.50	5.78
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.80	27.00	26.80	27.60
Barbed Wire (†)	6.05	6.05	6.05	6.23
Merchant Bars	4.95	4.95	4.95	5.33
Hot-Rolled Bands	5.15	5.15	5.15	5.43
Wire Rods, Thomas Commercial No. 5	5.10	5.17	5.15	5.42
Wire Rods, O-H Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Bright Common Wire Nails	6.85	6.95	6.90	7.15

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling. †Per 82-lb. net, reel.

Sizes OD				
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

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For *quality* special steels, look no further than your local Crucible warehouse. There you'll find a wide assortment of tool, stainless, alloy and other special steels . . . in most sizes and grades . . . and *all* with the high quality that has earned Crucible the reputation *First Name in Special Purpose Steels.*

So, for prompt delivery of quality special steels – *call Crucible.*

Stocks maintained of:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits, Hollow Drill Steel and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el . . . AISI Alloy, Onyx Spring and Special Purpose Steels

CRUCIBLE first name in special purpose steels

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amounted to 1,328,604 tons. A year ago it was 2,040,534 tons.

Considerable bridge work is being figured, but as annual budgets begin to expire a temporary lull in structural market activity is in prospect in some districts.

Fabricators point out that budgets are likely to have more adverse influence than weather conditions at this time of the year. For instance, some states have just about used up their authorized funds.

Several schools and other public building are being figured, however, and there is still a moderate amount of commercial work.

Order backlogs are not so extended as a year ago, but most fabricating shops are reported to be in comfortable position.

Keen competitive conditions prevail in the market, and, in some instances, profit margins are being shaved extremely thin.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2250 tons, hangar, Larson Air Field, Moses Lake, Wash., to Clinton Iron Works, Clinton, Iowa; Donald M. Drake Co. and George A. Fuller, Portland, Oreg., general contractors, joint low at $1,616,000, to Boeing Airplane Co.

1500 tons, reconstruction of Third Ave. bridge, New York, through Terry Construction Co., that city, to New York Shipbuilding Corp., Camden, N. J., and a Pittsburgh district fabricator.

500 tons, Copper river bridge, Alaska; to Bethlehem Pacific Coast Steel Corp., Seattle; Boen-Egge Co., Seattle, general contractor.

390 tons, shop building, Bridgeport Hardware Co., Bridgeport, Conn., to Topper & Griggs (Bethlehem Fabricators, Inc.,) Hartford, Conn.; Edwin Moss & Son, Bridgeport, general contractors.

335 tons, wool processing plant, Santee River Wool Combing Co., Jamestown, S. C., to American Bridge Division, U. S. Steel Corp., Greenville, S. C., general contractor.

250 tons, multi-purpose hangar, Larson Air Field, Moses Lake, Wash., to Capital Iron Works, Oklahoma City, Okla.; Donald M. Drake Co. and George A. Fuller, Portland, Oreg., general contractors; joint low to U. S. Engineer, Walla Walla, Wash., at $497,000.

240 tons, senior high school, Holbrook, Mass., to Waghorne-Brown Co. (Bethlehem Fabricators, Inc.,) Boston; Park Construction Co., Boston, general contractor.

200 tons, additional alert hangar, Westover Air Field base, Chicopee, Mass., to International Steel Co., Evansville, Ind.; F. D. Rich Co., Stamford, Conn., general contractor.

100 tons or more, warehouse and office building, Cabot-Cabot & Forbes, Pittsburgh, to Levinson Steel Co., Pittsburgh; Vappi Construction Co., Cambridge, Mass., general contractor.

STRUCTURAL STEEL PENDING

13,000 tons, approximately, tunnel lining, Hampton Roads, Va., Merritt-Chapman & Scott Corp., New York, awarded general contract; also involved are two bridges.

4050 tons, bridge work, contract No. N-62, Jersey City, N. J., bids to be opened by the New Jersey Turnpike Authority, New Brunswick, N. J., Nov. 23; also required are 3430 feet of metal railing.

3609 tons, state bridge work, Berks county, Pa., bids Nov. 19; also 670 tons of reinforcing bars.

2290 tons, highway structures, St. Joseph county, Indiana; bids Nov. 17, Indiana Toll Road Commission, Indianapolis, contracts C-28/29 and C-30.

2075 tons, state bridge work, Mercer county, Pa., bids Nov. 19; also 396 tons of reinforcing bars.

2000 tons, double cantilever maintenance hangar, Pope Air Field Base, Fort Bragg, N. C.; bids in.

995 tons, highway structures, St. Joseph county, Indiana; bids Nov. 10, Indiana Toll Road Commission, Indianapolis, contracts C-31 and C-32.

725 tons, four municipal bridges for Frankfort creek flood control, Philadelphia; bids Nov. 23.

642 tons, state bridge, Lycoming county, Pa., A. C. Hack & Sons Inc., Bloomsburg, Pa., low on general contract.

375 tons, Warwick High School, Lancaster county, Pa., John H. Wickersham, Lancaster, Pa., low on general contract.

372 tons, state bridge, Indiana county, Pa., Adam Eidemiller Inc., Greensburg, Pa., low on general contract.

340 tons, state bridge work, Delaware county, Pa., bids Nov. 19; also 130 tons of reinforcing bars.

198 tons, Pennsylvania railroad bridge, Adamas, N. J., Brann & Stuart, Philadelphia, low on general contract.

188 tons, state bridge work, Lancaster county, Pa., bids Nov. 19.

100 tons plus, laboratory, cold storage and other structures; bids to U. S. Engineer, Anchorage, Alaska, Dec. 1.

100 tons plus, 288 sections, trashracks, lift beams, etc., the Dalles dam project; bids to U. S. Engineer, Portland, Oreg., Jan. 4. Spec. No. 55-88.

REINFORCING BARS . . .

REINFORCING BARS PLACED

350 tons, Copper river bridge, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; Boen-Egge Co., Seattle, general contractor.

115 tons, high school, Holbrook, Mass., to

(*Please turn to page* 163)

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for Every Purpose - -

The most productive and modern perforating equipment in the world is at your service when you deal with Accurate. This means lowest cost—precision perforating. Versatile Accurate Perforating has hundreds of dies ready for service—and is equipped to develop unlimited patterns. Let us help you solve your perforating problems. Write for our FREE catalog.

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Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$24.00-$25.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb. Mo content mines unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.50-$3.90
60-65%	4.10-4.50

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $114; Salina, Pa., $119; Niles O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O. $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala. $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Pa., $183.50; Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net ton, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5⅛	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.00
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

Fast Delivery

Quality

SIMONDS INDUSTRIAL CUT GEARS

★ FINISHED GEARS
★ CUSTOM GEAR CUTTING
★ HEAT-TREATED, CASE OR FLAME-HARDENED

You are sure of quality and prompt service when you place your industrial cut gear requirements with SIMONDS GEAR. We produce the full range of sizes in the types and materials you need from your blanks or ours. Let us quote on your next gear requirements.

* * *

Stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

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BEVEL GEARS
MITRE GEARS
WORMS • WORM GEARS
RACKS • PINIONS

Cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite

SIMONDS GEARS

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Quality Gears for over 60 years

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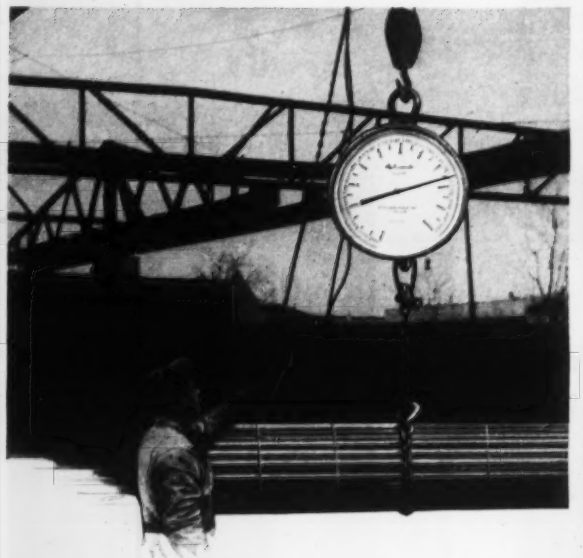
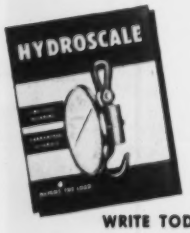
You're sure of getting WHAT YOU PAY FOR!



Hydroscale will save you many times its cost by providing an accurate check on everything you buy by weight! One company paid for its Hydroscale in just two lifts, which disclosed short-weight errors of several thousand pounds.

Specially designed for easy attachment to any crane or hoist, Hydroscale lifts and weighs in one operation. It gives you an accurate weight-check on all materials handled in your plant and shipping-receiving operation.



There's a size and model Hydroscale to fit your specific requirements. 36 models—500 to 100,000 lbs. capacity —12", 24", 30" dials. It will pay you to get the facts!

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LIFTS AND WEIGHS IN ONE OPERATION

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CHICAGO	Manhattan Bldg.
NEW YORK	150 Nassau St.

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• PUNCHES • DIES • CHISELS • RIVET SETS •
IF IT'S *RIVETED* YOU KNOW IT'S SAFE
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any size or shape product, any size
order from the smallest to the largest
Excellent facilities for pickling and oiling
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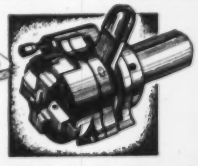
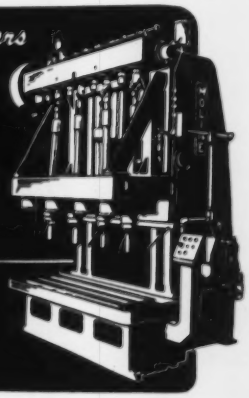
H&C Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

MOLINE
For Over 50 Years
"HOLE-HOG"
Specially Designed
MACHINE TOOLS
Have Cut Production Costs for American Industry

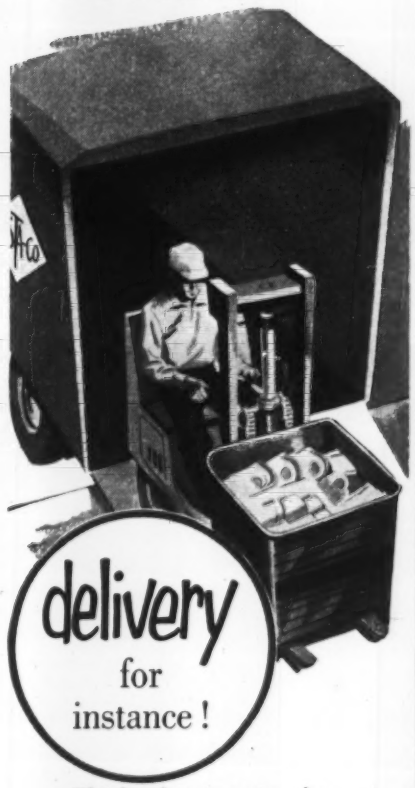


MOLINE TOOL CO.

No. HU68 Hydraulic rail feed universal joint type multiple spindle drilling machine

For Stampings

...look for the PLUS **beyond** the PRICE!



delivery for instance!

Think what it costs when your stampings aren't delivered on time.

Remember that *prompt delivery* – with a 39-year record to prove it – is just one of the plusses you get when you buy *Detroit* stampings.

Look for the plusses *beyond* the price the next time you buy stampings!

And be sure to try DETROIT

DETROIT STAMPING COMPANY
DE-STA-CO
359 Midland Ave., Detroit 3, Mich.

"America's Best-Known Jobbing Stampings Manufacturer"

(*Concluded from page* 160)

Bethlehem Steel Co., Bethlehem, Pa.; Park Construction Co., Boston, general contractor.

100 tons, including 52 tons for local warehouse and other projects, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, wool processing plant, Santee River Wool Combing Co., Jamestown, S. C., to Owens Steel Co., Columbia, S. C.; Daniel Construction Co., Greenville, S. C., general contractor.

REINFORCING BARS PENDING

1200 tons, barracks, Ft. Lewis, Wash.; Wick Construction and Dahlgren Construction Co., Seattle, joint low at $3,983,992 to U. S. Engineer, Seattle.

1000 tons, Gorge dam expansion, Skagit river project; bids to Seattle postponed from Nov. 10 to Dec. 1.

990 tons, highway structures, St. Joseph county, Indiana; bids Nov. 17, Indiana Toll Road Commission, Indianapolis, contracts C-28/29 and C-30.

925 tons, also 10 tons of shapes, Washington state bridge project, King county; bids to Olympia, Wash., Nov. 16.

670 tons, state bridge work, Berks county, Pa., bids Nov. 19; also 3609 tons of structural steel.

396 tons, state bridge work, Mercer county, Pa., bids Nov. 19; also 2075 tons of structural steel.

370 tons, highway structures, St. Joseph county, Indiana; bids Nov. 10, Indiana Toll Roads Commission, Indianapolis, contracts C-31 and C-32.

130 tons, state bridge work, Delaware county, Pa., bids Nov. 19; also 340 tons structural steel.

PLATES . . .

PLATES PLACED

925 tons, 30 to 48-in., steel pipe, water line, West Roxbury, Mass., Metropolitan District Commission, Boston, to Bethlehem Steel Co., Bethlehem, Pa.

PLATES PENDING

500 tons, estimated, two 90-ft steel reservoirs, 1.2-million-gal. capacity, Worcester, Mass., Pittsburgh-Des Moines Steel Co., Pittsburgh, low.

PIPE . . .

CAST IRON PIPE PLACED

1650 tons, 8 and 16-in., Metropolitan District Commission, Hartford, Conn., to Warren Pipe Co., Everett, Mass.

350 tons, 12-in., North Andover, Mass., to Warren Pipe Co., Everett, Mass.

100 tons, 20 and 24-in., West Springfield, Mass., to United States Pipe & Foundry Co., Burlington, N. J., through Sust & Williams, Dedham, Mass., general contractors.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago & Eastern Illinois, 25 fifty-ton box cars to own shops.

Denver & Rio Grande Western, 10 fifty-ton box cars to Pullman-Standard Car Mfg. Co., Chicago.

Gulf, Mobile & Ohio, 100 pulpwood cars to its Meridian, Miss., shops.

Nashville, Chattanooga & St. Louis, 200 pulpwood cars, to own shops.

Pennsylvania, 1000 fifty-ton box cars, to its own shops at Altoona, Pa.; 600 will be 40 ft 6 in. long and 400 will be 50 ft 6 in. long. Work will begin about Jan. 1.

Southern Pacific, 750 box cars, to own Sacramento, Calif., shops.

Western Pacific, 100 double door box cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

General Services, Seattle, for the Alaska railroad, 100 coal cars, 70-ton capacity; Pullman Standard Car Mfg. Co., Chicago, apparently low at $1,182,500; several alternatives under consideration.

Reading railroad, 1000 hopper cars, action deferred; will announce purchase of 200 gondola cars soon.

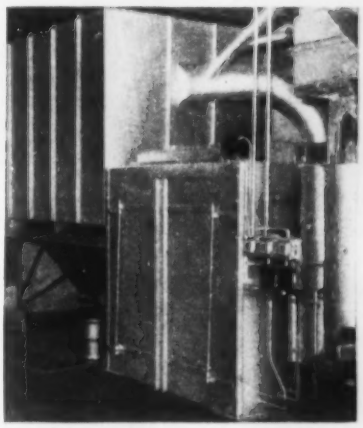
Reading Co., 200 sixty-five foot steel gondolas to cost $1,700,000. They will be designed to haul long steel structural designs and other extra long freight shipments.

"Tailor-Made"

TO YOUR REQUIREMENTS

MACLEOD

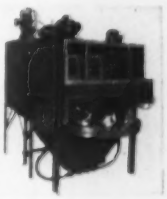
BLAST CLEANING ROOMS



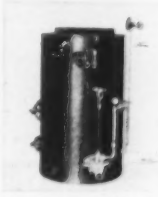
Modern Macleod Blast Cleaning Rooms—designed with the skill and know-how of more than half a century's manufacturing experience—are "tailor-made" to suit the desires of their users. That's why, whatever your specifications or requirements, you can be sure that a Macleod Blast Cleaning Room will fill your needs to your complete satisfaction.

For use with these rooms, Macleod offers a wide selection of Dust Arrestors—in both the screen and filter-tube types. They may be used either as an adjacent (as illustrated above) or outside building installation.

BLAST CLEANING CABINETS



Shown at right is the versatile, new type AL "Rapid Blast", specifically designed for high rates of continuous production, and especially adaptable to internal cleaning of work. Macleod offers several standard Blast Cleaning Cabinets, such as the "Rapid-Blast," but our Engineering Department will be happy to work with you in designing a special cabinet should your particular requirements demand it.



BLAST CLEANING MACHINES

The Macleod Type "H" Blast Cleaning Machine (at left), is available in both portable and stationary models. Along with low cost operation, it features low initial cost and superior blasting efficiency. Macleod offers an extensive line of Blast Cleaning Machines—portable and stationary, for floor level or pit installation, and in semi-automatic and fully-automatic, continuous cycle models.

57 YEARS of SERVICE TO INDUSTRY

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33 Mosteller Road, Sharonville, Ohio
Send this coupon for MACLEOD Bulletins:
☐ No. 600 Rooms ☐ No. 300-A Cabinets
☐ No. 200 Machines

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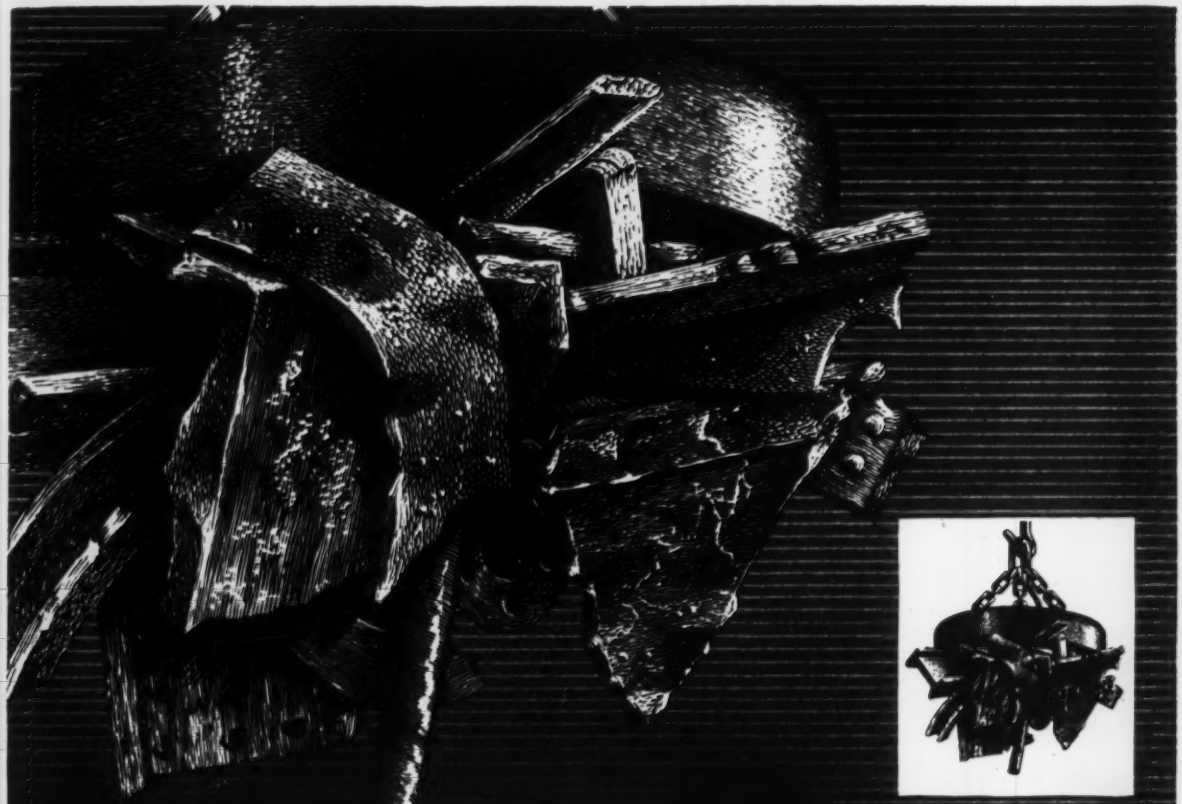

A SYMBOL OF LEADERSHIP IN IRON & STEEL SCRAP SINCE 1889

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EXPORTS-IMPORTS — LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* FORENTRACO

Scrap . . .

Scrap Prices, Page 166

Boston — Steel scrap prices are firmer. Export buying is maintained with No. 1 heavy melting quoted $28 to $29, dock. This is contributing to stronger domestic prices on moderate buying volume.

No. 1 bundles are notably strong, and sales $1 above No. 1 heavy melting are frequent. Not enough volume in cast scrap is coming out to bring these grades into line with the advances in steel scrap.

New York — Brokers have advanced buying prices on machine shop turning to a range of $10 to $11, on short shoveling turnings, $12.50 to $13.50. All other prices are unchanged.

Buffalo—With dealers and brokers admitting they are forced to boost bids to cover old sales, steelmaking scrap prices jumped $1 a ton in the local market. Blast furnace items advanced a similar amount. Dealers are expecting new mill buying at the higher levels. Export demand is cutting into mid-states supplies.

Philadelphia—Domestic steel scrap prices have advanced again, based on modest buying and continued strong demand from abroad.

Most recent increases amount to about $1 a ton. No. 1 heavy melting and No. 1 bundles are higher at $33.50, delivered, No. 2 heavy melting at $31.50 and No. 1 busheling at $31.

Pittsburgh—Improved market sentiment the past month is reflected in higher prices paid for a shipment of No. 1 heavy melting scrap to an area mill. The scrap, purchased in Pittsburgh, sold for $35. No. 2 heavy melting, as well as No. 1 and No. 2 bundles and No. 1 busheling, shared in the $2 advance.

Detroit—Some scrap trade interests expect softening in the local market over the next few weeks, with probable price declines of $1 to $2 on some items. But the present market is active.

Cincinnati—A much stronger scrap market has developed here. Buying prices of one mill have pushed open hearth grades to a higher level. Turnings and borings also have moved up in a delayed action.

Birmingham—Export demand for scrap continues to exert the major influence upon the price structure here, a considerable tonnage moving mostly through East Coast ports.

Chicago — Steelmaking grades of scrap last week held the price level of the preceding week. But the general tone of the market was a little less certain. Although the steelmaking rate is advancing slowly, scrap consumers are buying sparingly and otherwise pressing for lower prices. Some cast iron grades are off $1 a ton.

St. Louis—Scrap demand reflects the pickup in steelmaking operations. Prices, however, have not been affected to any material extent. Mills are taking all offerings but are declining to bid up the market.

Los Angeles — Dealers' October sales volume was 5 to 10 per cent less than that in September. Increased sales of No. 1 bundles at $20 are reported, but quantities are not large.

San Francisco—Conflicting opinions exist in the scrap market. Dealers say the situation is "tight" and are inclined to hold for a price increase. The mills, however, are comfortably stocked and show little inclination to lift their present quotations.

Seattle—Scrap prices advanced $2 per ton last week, reflecting largely firmness in other markets. Currently, $27 and $23 for No. 1 and No. 2 heavy melting steel, respectively, are quoted. Dealers question whether the higher prices are based on a realistic appraisal of the market. Some doubt they can be maintained.

Warehouse . . .

Warehouse Prices, Page 153

Jones & Laughlin Steel Corp. will begin operations Dec. 1 at its new warehouse in Lancaster, Pa. It will carry a full line of J&L steels.

Market sentiment is improving. Increased demand includes all products, particularly flat-rolled which are growing tight at the mill level. The recently announced increases in quantity extras on bars at mills should stimulate business for distributors of carbon and alloy bars.

In Seattle, distributors dealing in aluminum and other specialties report sustained sales volume. Active construction, especially houses, has expanded demand for aluminum items and further increase is anticipated. Deliveries of galvanized steel from warehouses have been extended to as much as three months at a number of market centers.

Plates . . .

Plate Prices, Page 148

Competition is increasingly sharp in the plate market. This is reported from virtually all marketing centers. Demand in general continues limited. There are only a few encouraging signs of betterment in the offing, a point that sticks out like a sore thumb in view of the current general quickening demand for other steel products—notably sheets and strip.

Providing a promising note in the East, the New York Shipbuilding Corp., Camden, N. J., having been promised the co-operation of its union employees following a period of threatened disruption, has booked a contract for four destroyer escorts. District plate mills also report a slight pickup in freight car maintenance and construction, notably by the Pennsylvania. It will start build-

(*Please turn to page* 168)

HEART OF BALTIMORE LOCATION
LORD BALTIMORE HOTEL
No matter for what reason you come to Baltimore, the chances are we're nearest to where you want to go.

WARD STEEL CO.
We specialize in
FINISHED STEEL
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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Nov. 3	$33.67
Oct. 27	32.67
Oct. Avg.	32.25
Nov. 1953	35.00
Nov. 1949	28.96

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*28.00-29.00*
No. 1 busheling	*33.00-34.00*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut structurals, 5 ft lengths	*35.00-36.00*
Heavy turnings	30.00-31.00
Punchings & plate scrap	36.00-37.00
Electric furnace bundles	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	32.00-33.00
Heavy breakable cast	31.00-32.00
Unstripped motor blocks	23.00-24.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 2-ft and under	44.00-45.00
Rails, 18-in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Railroad specialties	37.50-38.50

Stainless Steel Scrap

18-8 bundles & solids	180.00-190.00
18-8 turnings	85.00-90.00
430 bundles & solids	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*33.00-34.00*
No. 2 heavy melting	30.00-31.00
No. 1 bundles	*33.00-34.00*
No. 2 bundles	26.00-27.00
No. 1 busheling	*33.00-34.00*
Machine shop turnings	16.00-17.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	34.00-35.00
Cut structural plate 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	23.00-24.00
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	33.00-34.00
Stove plate	38.00-39.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	30.00-31.00
Brake shoes	31.00-32.00
Clean auto cast	44.00-45.00
No. 1 wheels	37.00-38.00
Burnt cast	29.00-30.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	44.00-45.00
Rails, 3-ft and under	*47.00-48.00*
Rails, 18 in. and under	*48.00-49.00*
Rails, random lengths	*44.00-45.00*
Cast steel	36.00-37.00
Railroad specialties	36.00-37.00
Uncut tires	37.00-38.00
Angles, splice bars	43.00-44.00
Rails, rerolling	55.00-56.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	170.00-180.00
18-8 turnings	70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	35.00-36.00
No. 2 bundles	27.00-28.00
Machine shop turnings	14.00-15.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	36.00-37.00
Electric furnace bundles	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting	32.00-34.00
No. 2 heavy melting	30.00-31.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	33.00-34.00
No. 2 bundles	23.50-24.50
No. 1 busheling	32.00-34.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals, 3-ft	35.00-36.00
Punchings & plate scrap	35.00-36.00
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	33.00-34.00
Unstripped motor blocks	25.00-26.00
Clean auto cast	*43.00-44.00*
Drop broken machinery	*43.00-44.00*

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	42.00-44.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	43.00-44.00
Rails, rerolling	54.00-55.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00
430 turnings	20.00-25.00

Chicago Mercantile Exchange

No. 1 Heavy Melting
(Week ended Nov. 3)

	High	Low	Close
Jan.	36.50	36.50	36.50*
Mar.			37.00*

Sales (40-ton units): 3 January

* Nominal

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00
No. 2 heavy melting	*20.00*
No. 1 bundles	27.50
No. 2 bundles	20.00
No. 1 busheling	26.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	*15.00*
Punchings & plate scrap	27.00

Cast Iron Grades

No. 1 cupola	34.00
Charging box cast	27.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	38.00
Malleable	30.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*30.00-31.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*18.00-19.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Low phos. 18-in.	*35.00-36.00*

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast	36.00
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18-in. and under	46.00-47.00
Rails, random lengths	38.00-39.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*33.50*
No. 2 heavy melting	*31.50*
No. 1 bundles	*33.50*
No. 2 bundles	27.50
No. 1 busheling	*33.00*
Electric furnace bundles	*33.50*
Machine shop turnings	*19.50*
Mixed borings, turnings	*19.50*
Short shovel turnings	*21.00-22.00*
Structurals & plate	*35.00-36.00*
Heavy turnings	*31.00-31.50*
Couplers, springs, wheels	*35.00*
Rails crops, 2 ft & under	45.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Malleable	37.00*
Heavy breakable cast	36.00-36.50
Drop broken machinery	42.00-43.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	27.00-28.00
No. 2 bundles	21.00-22.00
Machine shop turnings	*10.00-11.00*
Mixed borings, short turnings	11.00-12.00
Low phos. (structural & plate)	29.00-30.00
Short shovel turnings	*12.50-13.50*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	23.00-24.00

Stainless Steel

18-8 sheets, clips, solids	170.00-175.00
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*23.00-24.00**
No. 2 heavy melting	*20.00-20.50*
No. 1 bundles	*24.00-25.00*
No. 2 bundles	*16.50-17.50*
Mixed borings, turnings	10.00-10.50
Machine shop turnings	*9.50-10.00*
Short shovel turnings	11.50-12.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	32.00-33.00

* $4 to $4.50 higher for export.

BUFFALO

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*27.50-28.50*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*25.50-26.50*
No. 1 busheling	*31.00-32.00*
Machine shop turnings	*16.50-17.50*
Mixed borings, turnings	*18.50-19.00*
Short shovel turnings	*19.50-20.00*
Cast iron borings	*18.50-19.00*
Low phos.	*34.00-35.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	38.00-39.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

BIRMINGHAM

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	23.00-24.00
No. 2 bundles	19.00-20.00
Cast iron borings	16.00-17.00
Short shovel turnings	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	33.00-34.00
Structural plate, 2 ft	33.00-34.00
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	30.00-31.00
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	40.00-41.00
Angles, splice bars	38.00-39.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	30.00
No. 2 bundles	23.50
Machine shope turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	38.00
Charging box cast	29.00
Heavy breakable cast	29.00
Unstripped motor blocks	29.00
Brake shoes	30.00
Clean auto cast	41.00
Stove plate	35.00

Railroad Scrap

No. 1 R.R. heavy melt	35.00
Rails, 18-in. and under	46.00
Rails, random lengths	45.00-48.00
Rails, rerolling	*54.00*
Angles, splice bars	44.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	*27.00*
No. 2 heavy melting	*23.00*
No. 1 bundles	21.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	12.00
Electric furnace, No. 1	32.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	32.00-35.00
Heavy breakable cast	23.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	43.00-46.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

HAMILTON, ONT.

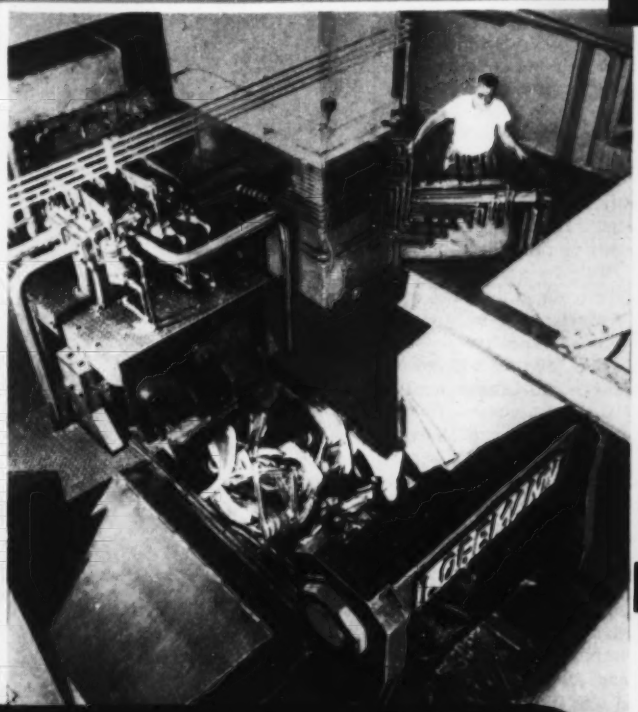
(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



LOGEMANN Metal Balers

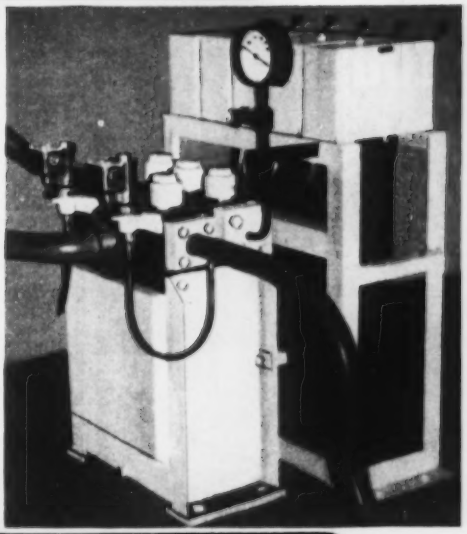
. . . powerful . . . compact . . . capable of high tonnage output!

In the large stamping plants and rolling mills where it is critically important that trim and stamping skeletons are quickly disposed of to avoid interference with production, LOGEMANN metal balers are relied on to keep ahead of production and pack such scrap into high density, self-cohering bricks for re-melting.

Hundreds of installations have established new records for tonnage, minimum maintenance, reliability, over extended periods of uninterrupted operation at high-speed.

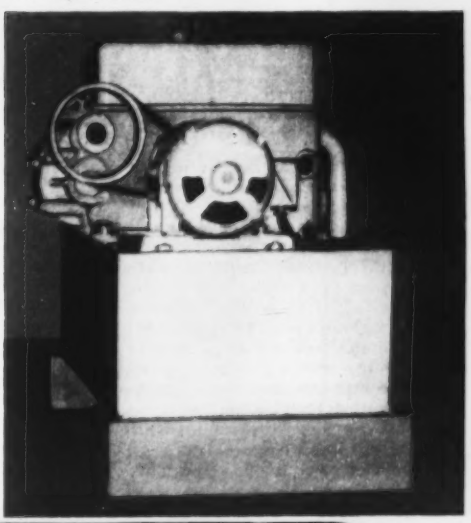
LOGEMANN models are not confined to the large sizes. Many small plants have found it profitable to use smaller sizes embodying the same features of reliability, at minimum operating cost. Interested parties are invited to write for details. Information as to the character of the scrap, tonnage to be handled in a given period of hours, and range of gauges is helpful in determining the proper model.

LOGEMANN



HYDRAULIC VALVES

The illustration shows a close-coupled hydraulic valve, operated by compressed-air cylinders for high-speed distribution of large gallonage of fluid at high pressure. LOGEMANN engineers have designed and built valves for many unusual as well as standard applications, and will welcome inquiries, with an outline of the conditions and requirements.



HYDRAULIC PUMPS

The opposed-cylinder close-coupled double pressure pump shown in the illustration is mounted on an individual tank to conserve floor space under present crowded plant and operating conditions. When requesting details, please indicate the nature of the service, pressure and gallonage requirements, and the fluid to be handled.

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6007-UM *Write today for Bulletin 53*

THE UNITED MANUFACTURING CO.
1119 W. INTERSTATE ST., BEDFORD, OHIO

(*Concluded from page* 165)

ing 100 box cars at Altoona, Pa., around the first of the year.

Specifications for domestic tanks and boilers are in fair volume, although buying in general is hand-to-mouth with mills able to offer shipments within two weeks. New England shops are booking enough volume to maintain operations that are seasonally high on household and similar tanks. Larger field-erected tanks are going to fabricators outside the area. Pittsburgh-Des Moines Steel Corp., Pittsburgh, has two steel reservoirs, Worcester, Mass., totaling 1.2 million gallons capacity.

The Navy has distributed several thousand tons of hull plates against an opening late last quarter. Lukens Steel Co. will roll a large share of this tonnage. The mill has a new 500-ton press for flattening.

Pig Iron . . .

Pig Iron Prices, Page 153

Several blast furnaces will be relighted within the next two weeks, showing sustained improvement in demand. Shipments of pig iron to foundries exceeded expectations in October and are likely to make further gains this month. Most captive foundries are not doing too well, but jobbing shops are busier.

In addition to heavier consumption, market improvement also is due to the fact that consumers' inventories have dropped below safe working levels and must be replenished.

Iron Ore . . .

Iron Ore Prices, Page 161

October shipments of 7,251,005 tons brought the movement of iron ore on the Great Lakes for the 1954 shipping season to Nov. 1 to only 57,858,433 gross tons. This compares with 90,544,018 tons in the corresponding period of the 1953 season.

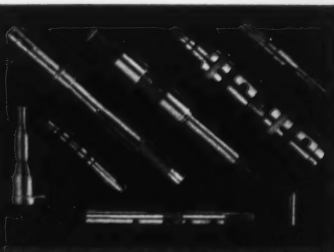
Vessel operators think the total season movement will not exceed 62 million gross tons with a large portion of the active fleet scheduled to be taken out of service about Nov. 15.

Shipments in the latest week (ended Nov. 1) were 1,458,164 tons. This compares with 2,337,375 tons in the like week of the 1953 season.

Rails, Cars . . .

Track Material Prices, Page 151

Purchase of two hundred 65-ft steel gondolas at a cost of about $1,700,000 is planned by the Reading railroad. These long cars, designed to haul long structural steel designs and other extra long freight, are in tight supply.



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CLASSIFIED

Help Wanted

FORGE SHOP FOREMAN by Eastern manufacturer of small and medium sized quality drop forgings. Must be thoroughly experienced in the forging field particularly in the use and maintenance of board drop hammers. Applications treated strictly confidentially. Should include experience, age and salary expected. Apply Box 154, STEEL, Penton Building, Cleveland 13, Ohio.

Assistant Superintendent for large Stainless Sheet and Strip Mill, located in Pittsburgh district. Must be familiar with processing methods of cold rolling, continuous annealing, pickling, etc. Should have supervisory experience. Please furnish information on background, experience, etc. with application. Reply Box 156, STEEL, Penton Building, Cleveland 13, Ohio.

CHIEF DRAFTSMAN for large structural steel fabricating shop, located in East. First class man with at least 10 years experience on shop details for mill, office, loft buildings, bridges. Answers confidential. Salary high. Position permanent. Fringe benefits. Engineering Degree preferred. Reply Box 159, STEEL, 60 East 42nd Street, New York 17, New York.

Positions Wanted

PLANT AND PRODUCTION MANAGER, Engineering Graduate (M.I.T.) indoctrinated in practical operating experience. Proven record of accomplishment in efficient plant supervision, control, and cost reduction coupled with amicable labor relations. Reply Box 134, STEEL, Penton Building, Cleveland 13, Ohio.

ESTIMATOR AND CONTRACT MANAGER. Graduate structural engineer. 26 years experience in estimating, sales, and management of structural steel and plate fabrication. Reply Box 142, STEEL, Penton Building, Cleveland 13, Ohio.

EXPERIENCED FORGING ENGINEER AVAILABLE. Expert in hand tools and railroad work, production, design and management. Willing to travel. Passport in order. Reply Box 145, STEEL, Penton Building, Cleveland 13, Ohio.

SEASONED EXECUTIVE
With Strong Background

PRODUCTION, PLANT ENG., TOOL ENG. Desires broader opportunity. Functions well at policy level. Presently master mechanic of $3,000,000 stamping and assembly manufacturing company. Reply Box 149, STEEL, Penton Building, Cleveland 13, Ohio.

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Desires change. Twenty-five years experience in sheet metal stampings and related assemblies. Specialized in progressive and deep draw dies. Good organizer, functions well at top level. Reply Box 150, STEEL, Penton Building, Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted," set solid, 50 words or less $15.00, each additional word .30; all capitals, 50 words or less $19.20, each additional word .3$; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14; all capitals, 25 words or less $4.50, each additional word .18; all capitals leaded, 25 words or less $5.40, eaah additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Classified rates with the exception of "Positions Wanted" are subject to 15 per cent agency commission and 2 per cent cash discount ten days. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

PLANT SUPERINTENDENT

For small long-established Forging Plant in Akron, Ohio. Prefer man who has a good knowledge of Small Upsetters (2" sizes), Drop Hammers (3000 lbs), Maxi Presses, Punch Press, Tool and dies, etc. Plant manufactures nationally known line of Mechanic Hand Tools.

If you have proven supervisory and management ability in directing a working force of approximately 50 people, write stating full particulars, salary expected, etc.

Box 155, STEEL

Penton Building **Cleveland 13, Ohio**

EXPERIENCED STEEL MEN WANTED

CHIEF ENGINEER
MASTER MECHANIC
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Excellent opportunities with a small steel plant in Middle West, specializing in electric furnace production and rolling of high quality killed carbon and alloy steels.

Apply by letter stating complete qualifications and salary expected. All communications will be held in strictest confidence.

Reply Box 152, STEEL

Penton Building **Cleveland 13, Ohio**

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High Alloy Castings

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TO REPRESENT WELL ESTABLISHED HIGH ALLOY FOUNDRY PRODUCING HEAT AND CORROSION RESISTANT CASTINGS AND TUBES. A REAL OPPORTUNITY FOR A MAN WITH PROVEN BACKGROUND IN SELLING TO INDUSTRY. DRAWING ACCOUNT AND COMMISSION.

Write Box 158, STEEL

Penton Building **Cleveland 13, Ohio**

SALES ENGINEER

High Alloy Castings

California Territory

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Write Box 157, STEEL

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FOR SALE

Two overhead traveling Alliance "Soaking Pit" Cranes, complete with tongs for handling ingots. Seventy-two foot span, 25-ton auxiliary hoist, 15-ton main hoist. Can be seen in operation. Must be sold by December 1.

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Push-Button Automatic Stretcher Leveling With A 100,000-Pound Pull!

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STRETCHER LEVELER

Model SL50-8/445

- Push buttons control all clamping and stretching operations.
- Machine automatically travels at a high rate of take-up speed, then shifts automatically to low-speed stretching cycle. Three-speed stretching cylinder exerts a 50-ton pull continuously.
- When pre-set percentage of stretch is reached, machine automatically stops so stretching cylinder can be unloaded and grip jaws opened to release workpiece.
- Machine can be set from extreme length of 45 feet down to 10 feet in 30 seconds.
- To facilitate rapid setup for various lengths, output head is equipped with gear motor, and holding pins are extended or retracted automatically by an air cylinder that is push button operated.
- Both gripping heads are mounted on anti-friction roller bearings. Additional rollers on bottom of heads prevent "kickup."

WRITE FOR COMPLETE DETAILS

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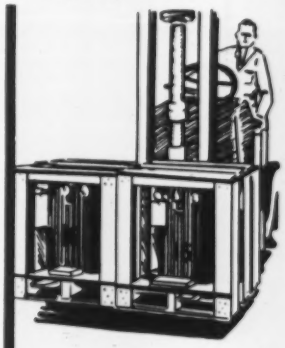

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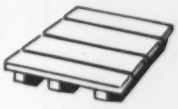
Cut and assembled to your specifications.



BOXES:
Assembled or knocked down

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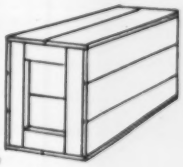
Strong Southern pine will carry the heaviest material.



SHOOKS:
Cut-to-order box shooks offer a tremendous freight advantage by eliminating excess weight.

Send complete information as to quanity, size, etc. Include drawing if possible.
Complete price and delivery quotations will be furnished immediately. Samples if requested.

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EXTRA LOW-CARBON* FERROCHROMIUM

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That's the horsesense way to use horsepower whether you want 1/8 horsepower or 400 horsepower.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO

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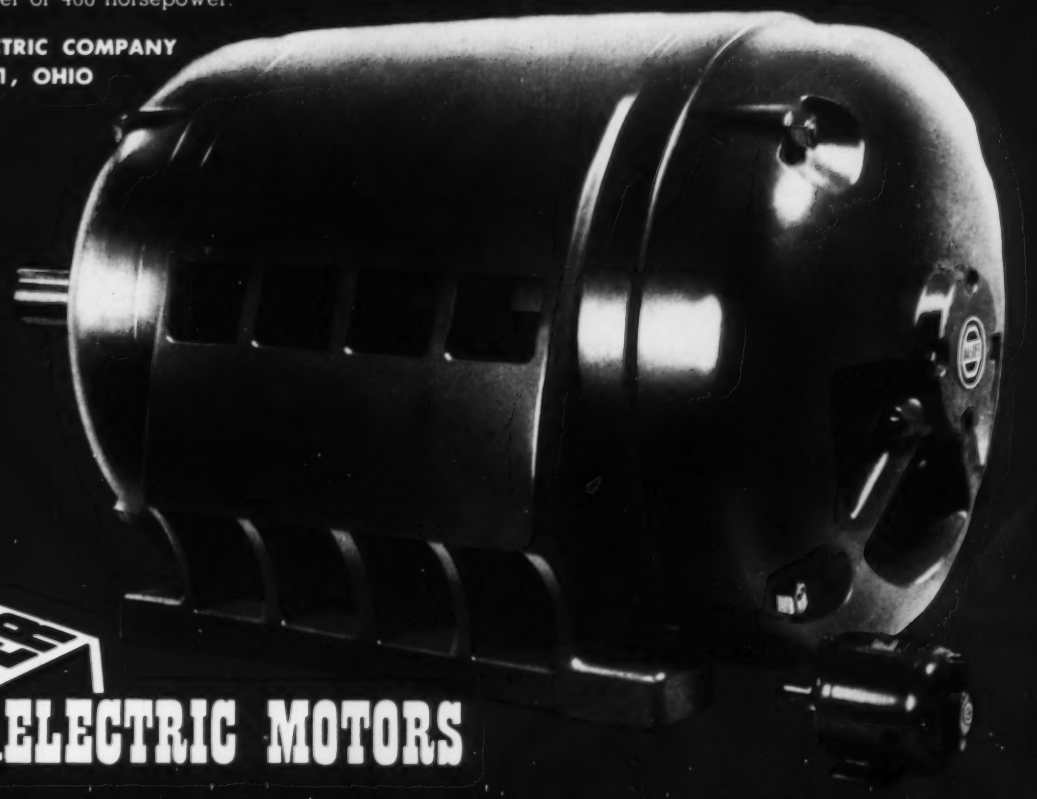
HORSEPOWER



MASTER
ELECTRIC MOTORS

TIMKEN® bearings ended lubrication headaches on this hot mill 26 years ago

WHEN Wheeling Steel purchased this hot-strip mill in 1927, they specified Timken® tapered roller bearings for the roll necks on the work rolls and back-up rolls. These bearings have given extremely satisfactory service for the past 26 years while using economically applied, low-cost grease for bearing lubrication.

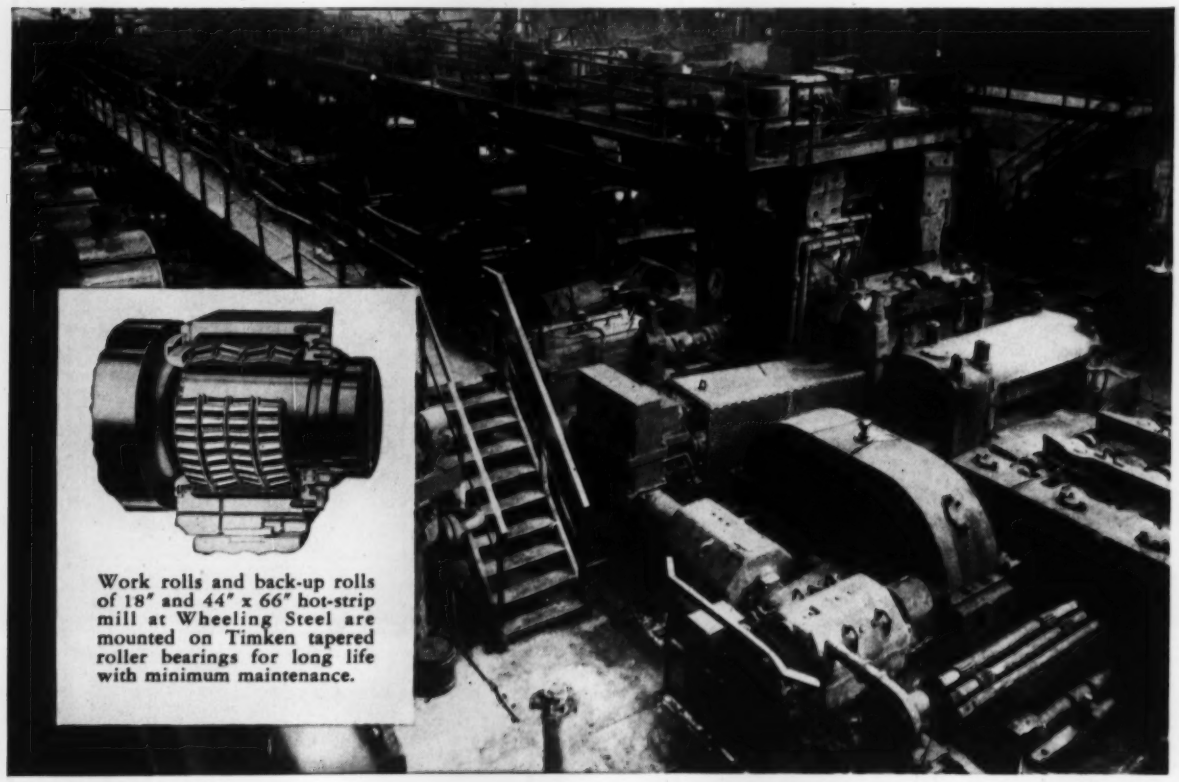
Their experience with grease-lubricated Timken bearings proves that there's no loss of lubricant during roll changes. Moreover, rolls can be changed in less time. And Timken bearings make closures more effective and reduce loss of lubricant because they keep the roll neck concentric with its chock.

Using Timken bearings will simplify mill designs all around. No special thrust units are needed because Timken bearings take both radial and thrust loads in any combination.

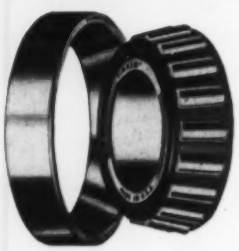
Timken bearings have exceptionally low frictional resistance—the result of true rolling motion based on proper geometric design and precision manufacture. This low friction reduces starting resistance and permits mills to accelerate more rapidly. Higher mill speeds are possible. Skidding or scuffing between work roll and back-up roll is reduced.

Timken bearings can be applied to machinery of any type to make it run better and last longer. Look for the trade-mark "Timken" on the bearings in the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



Work rolls and back-up rolls of 18" and 44" x 66" hot-strip mill at Wheeling Steel are mounted on Timken tapered roller bearings for long life with minimum maintenance.



TIMKEN

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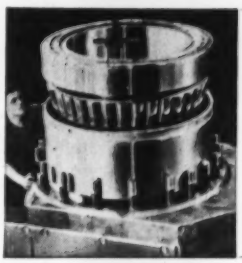
TAPERED ROLLER BEARINGS



ROLL NECK BEARING ENGINEERING SERVICE

Our field and service engineers have had years of experience with problems of roll neck bearing design and operation. They'll help you select bearings and design mountings. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

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